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# WASTE ISOLATION PILOT PLANT LAND WITHDRAWAL

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## HEARINGS

BEFORE THE

## COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON THE

DEPARTMENT OF ENERGY'S WASTE ISOLATION PILOT PLANT

AND

## S. 2420

TO WITHDRAW CERTAIN PUBLIC LANDS IN EDDY COUNTY, NM, AND FOR OTHER PURPOSES

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APRIL 3 AND 26, 1990

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# WASTE ISOLATION PILOT PLANT LAND WITHDRAWAL

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TUESDAY, APRIL 3, 1990

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
*Washington, DC.*

The committee met, pursuant to notice, at 9:38 a.m., in room SD-366, Dirksen Senate Office Building, Hon. J. Bennett Johnston, chairman, presiding.

## OPENING STATEMENT OF HON. J. BENNETT JOHNSTON, U.S. SENATOR FROM LOUISIANA

The CHAIRMAN. Good morning.

The purpose of today's hearing is to receive testimony on the Waste Isolation Pilot Plant in Carlsbad, New Mexico. The Waste Isolation Pilot Plant is the Department of Energy's facility for defense transuranic waste. The WIPP facility is a very important piece of the Department's plans for cleaning up the nuclear weapons complex.

Today we will hear from a very distinguished group of witnesses on the status of WIPP, and on its readiness to open to begin a five-year demonstration phase.

We will also hear from witnesses on proposed legislation to withdraw the public lands surrounding the WIPP site.

WIPP is a research and development facility of the Department of Energy that was authorized for the purpose of demonstrating the safe disposal of radioactive waste generated by DOE's nuclear weapons production activities.

The WIPP facility, built 2,000 feet below the surface at the Delaware salt basin in New Mexico, has been under construction since 1981. Construction of the facility is now completed. And the facility will soon be ready to begin the demonstration phase.

The opening of the WIPP facility is a very important part of the weapons production cycle, because it will demonstrate that we have the technology necessary to store and dispose of the byproducts of these weapons safely.

Transuranic waste from our Nation's defense production activities is generated and stored at 10 DOE sites around the country. At some of these sites we are running out of the limited temporary storage space. Therefore, the opening of this facility will be an extremely important step in demonstrating that the defense waste cleanup is underway at DOE sites around the country.

I am anxious to hear from our witnesses today about when the WIPP facility will be ready to begin the five-year demonstration phase. During this phase, DOE will conduct a series of experiments to evaluate the facility's ability to comply with environmental laws governing the safe storage and disposal of nuclear waste.

The initiation of the demonstration phase will be a very important step.

Admiral Watkins has made significant progress at the Department of Energy in bringing order and excellence to the WIPP, as with the many other programs at the Department. Under the Admiral's guidance, the Department has prepared a draft decision plan on WIPP, identifying the activities that need to be completed prior to its opening.

I am encouraged that we seem to be moving quickly toward completion of many of these activities. Just yesterday, for example, the Environmental Protection Agency issued its draft ruling on the Department's petition for a no-migration variance under The Resource Conservation and Recovery Act.

There are still a number of items to be resolved, but I am optimistic that they can be completed within a reasonable timeframe.

The WIPP Decision Plan envisioned a decision on operational readiness for the facility by June of 1990. If all items are completed on schedule, WIPP would be ready to begin the demonstration phase by the end of 1990.

So I am anxious to hear from our witnesses today on the decision plan and on the readiness of WIPP to open.

Before we hear from our first distinguished colleague, I would like to ask Senator McClure if he has comments.

## STATEMENT OF HON. JAMES A. McCLURE, U.S. SENATOR FROM IDAHO

Senator McClure. Thank you very much, Mr. Chairman.

First of all, I want to commend you for scheduling this hearing, which will focus primarily on Secretary Watkins decision plan and the other surrounding incidents that must move forward on this plan.

I would ask unanimous consent that my statement be placed in the record in full.

The Chairman. Without objection.

Senator McClure. And let me summarize by simply saying this is not just a problem at WIPP, it is a problem back up the chain of activities. And Idaho has been a recipient of nuclear waste for a long, long while, and Idaho is getting tired of that, has gotten tired of that.

I have watched this since WIPP was authorized, now, 11 years ago; and since the construction was started, now, nine years ago. I am a patient man, and I would say most Idahoans are patient, but not all. And there are those who object to having any more waste brought into Idaho until there is a time we can take those wastes out.

It is not just a question of whether WIPP will be built, it is a question of whether or not we are going to be able to manage the nuclear waste stream in a technologically safe, environmentally sound, and in a way which meets the requirements of the national security of this country.

But we have got to get on with the job. I commend the Secretary for really trying very hard to do that, and to the several secretaries that are involved. Of course, Secretary Watkins has more responsibility than others in this regard.

But it has got to get done, and I am going to spend my effort doing what I can to move it forward as rapidly as is possible.

I realize, too, the concerns of the people in the State of New Mexico. If it were my state I would be concerned also. And you cannot push this thing, but there has to be something done that will help us move the tail end of the process and not just talk about it.

Thank you very much, Mr. Chairman.

[The prepared statement of Senator McClure follows:]

### STATEMENT OF HON. JAMES A. McCLURE, U.S. SENATOR FROM IDAHO

I commend the Chairman for scheduling this hearing on Secretary Watkins' Decision Plan relating to the opening of the Waste Isolation Pilot Plant in New Mexico and legislation to withdraw the public lands surrounding the WIPP site. It is critical that we resume consideration of the issues associated with this facility and work to resolve concerns in a responsible and timely manner.

I have been following the status of the Waste Isolation Pilot Plant ever since its inception back in 1979, when Congress passed the public law that authorized the WIPP project. During the eleven years since that time, I have observed great progress in the construction of the WIPP facility. Yet, at the same time, I have experienced much frustration, as I am sure all Idahoana have, with respect to the progress by the Department of Energy toward the initial phase of operation of the WIPP facility. Part of the delay that we have had to live with is institutional, part legal, part administrative, part regulatory, and part procedural.

For too long now Idaho has been standing by, waiting for a reprieve from the burden it has borne since 1970 of storing transuranic wastes produced at the Rocky Flats Plant in Colorado. For too long now Idaho has been given assurances that the waste will be removed from within our borders—assurances that have fallen by the wayside time and time again because of delays at the WIPP facility. For too long now, the concerns of the host state of the WIPP facility have been met, while the equally valid concerns of other players remain outstanding.

I am a patient man. Most Idahoans are patient people. Some, however, are not so patient. While the WIPP Environmental Impact Statement and its Supplement address the adverese impacts of having to store transuranic waste in Idaho for an additional, indefinite period of time, the real question is that Idaho may not accept any more of this waste for an indefinite period of time. I am not sure that a document, such as an Environmental Impact Statement, is the proper context within which to address such possibilities. I can guarantee you that there will be serious consequences not only to the environment, but to the national security of this nation, if the Department of Energy is not successful in providing a long-term disposal facility for the nation's transuranic waste.

Having participated in the WIPP debate that past few years, I would be remiss if I did not admit there were and still are a number of controversies surrounding the issue. However, we will never resolve any of the problems or concerns until we reinitiate the dialoque. This hearing is a good start. I look forward to the statements of withnesses this morning and want to particularly welcome Secretary Watkins and Secretary Lujan.

The CHAIRMAN. Thank you, Senator McClure.

Senator Bingaman.

## STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

Senator BINGAMAN. Thank you very much, Mr. Chairman.

This is a subject near and dear to my heart. I have spent most of my life working on this issue, it seems. As attorney general, we filed suit on behalf of the State of New Mexico against the Department of Energy, to assure that the very safeguards that the state felt were important, related to health and safety, would be included, and would be taken into account by the Department of Energy.

We have had a series of negotiations and agreements since then, between the state and the Department of Energy. And there are still some unresolved questions that I think need attention.

I want to commend Secretary Watkins for the way he has approached this. I think this draft Decision Plan for WIPP—which I hope he can explain to us and which is not an easy thing to understand—represents a very serious effort to come to grips with all the problems associated with it.

I do not know that those problems have all been resolved. In fact, I am sure some have not been as yet. I do think it is very important that we take testimony from all these witnesses and the others you have scheduled to come before the committee, before we determine whether or not legislation can move this year.

I thank you very much for holding this hearing.

[The prepared statement of Senator Bingaman follows:]

### Statement of Hon. Jeff Bingaman, U.S. Senator From New Mexico

I want to thank the Chairman for scheduling this hearing on the Waste Isolation Pilot Plant (WIPP). I know of his genuine concern for this project.

WIPP is designed to be an underground research and development facility to demonstrate the safe disposal of transuranic radioactive wastes resulting from U.S. nuclear defense activities and programs. The facility will be used to demonstrate the behavior of radioactive waste in a geologic respository, and also the handling, certification, and transportation of such waste disposal. The facility is located in southeastern New Mexico near the city of Carlsbad.

I am well acquainted with the WIPP facility. As Attorney General of New Mexico, I litigated and negotiated limitations on the WIPP mission. I have continued to press for the important health and safety provisions to ensure that New Mexico's interests are fully considered and protected.

WIPP is a subject that this Committee is very familiar with. I introduced legislation last Congress with Senator Domenici to accomplish a withdrawal of the land at WIPP, a requirement before the facility can accept any waste. This legislation was reported out of Committee but was never considered by the full Senate.

We will hear testimony today from the Secretary of Energy as he reports on his Department's progress in resolving many of the issues that have prevented land withdrawal legislation from being enacted in the past. I want to commend the Secretary for his leadership in trying to resolve these issues in a way which will restore public confidence in the Department of Energy. However, I believe there are several key issues still to be resolved before any legislation moves forward.

I look forward to discussing these issues today with our witnesses and at the continuation of this hearing on April 26. I do think it would be premature to take any legislative action with regard to WIPP until we have the benefit of hearing the testimony of all of our witnesses.

I will reserve any further discussion of the issues for my questions.

The **Chairman**. Thank you, Senator Bingaman.

Senator Domenici.

### STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

Senator **Domenici**. Thank you very much, Mr. Chairman.

First, Mr. Chairman, I do not understand all the emphasis on a land withdrawal bill. Frankly, I think some people misunderstand what a land withdrawal bill would do. They think it will open WIPP. A land withdrawal bill will not open WIPP.

As the Secretary has so candidly stated a number of times, and I commend him for it, WIPP will open only when it is safe.

Admiral Watkins, who will testify here today, came before this committee last year, Mr. Chairman, and in a fit of candor that this committee had never seen from a Secretary of Energy before, admitted that DOE has had problems in getting the job done at WIPP.

The Secretary identified many tasks related to the protection of health and safety that need to be completed before WIPP can open. Many of these tasks have yet to be completed. I am not pointing fingers, because DOE has made tremendous progress in completing health and safety tasks at WIPP in this past year.

But DOE admits, and the Secretary's plan concludes, that DOE must still—and I will just state five or six things—finalize the performance assessment plan for the test phase, demonstrate compliance with EPA storage standards, and acquire the remaining potash lease at WIPP site.

Now I have heard about that one for almost two years, that it will be done next week. I gather we are here again, Senator Bingaman, and even the potash lease has not been acquired.

Also, DOE must obtain state designation of the preferred WIPP transportation routes and approve the WIPP Final Safety Analysis Report. And there are about eight more safety tasks that have not been completed yet.

Now it seems to me that the desire to enact a land withdrawal bill has spurred DOE to complete many of the health and safety tasks. In other words, holding the land withdrawal bill over the head of DOE has spurred DOE to get on with these jobs.

I wonder if DOE would continue its emphasis on completing the remaining health and safety tasks if Congress were to approve a land withdrawal bill.

I believe we have to place the safety of WIPP before all other considerations. You would not let the tower clear a plane for takeoff if the pilot had not completed his pre-flight checklist, so why should Congress clear WIPP for takeoff when there are many items on the safety checklist that the Secretary acknowledges are not finished?

What is wrong with waiting for all of these health and safety protections to be in place before considering and passing a land withdrawal bill?

As a matter of fact, I would not think it would be terribly bad policy if you had them all done. And if there indeed was then a two or three month lag time, I do not think that would be the end of the world. I think it would be much easier and much safer for everyone to have them finished, and then bring a land withdrawal bill before the Congress. And I surmise that if they were done right, it would pass.

Mr. Chairman, I want to raise one last issue, and I will do it briefly. The Secretary has been very candid. He has built his credibility in an immense manner across this country. But I do want to put in the record right now two agreements that have been executed and signed by the State of New Mexico.

The first one was signed by the then Secretary of Energy many years ago, in 1982, in response to the lawsuit that Senator Bingaman won in federal district court. This is the section of the agreement regarding our roadway system and the good faith efforts of the Department of Energy to help New Mexico get legislation through.

I might remind my good friend, Senator McClure, I think we talked to you personally about the second one in August 1987. Our Governor of New Mexico, in August 1987, entered into an agreement supplementing that earlier agreement. And this is it. And it said that the Department would use their good faith efforts to help us in Congress get bypass and relief roadway money to make a safe road system in New Mexico for the transportation of waste to WIPP.

I would ask that both of them be put in the record, and I would merely state to the Secretary that I hope I heard him wrong, because I heard that he said last week that New Mexico had received all the money for roadways that it should get, that anything in addition was a gift, and that he did not support it.

I hope that is not that case. I do not see how that is a good faith effort, those are the words in here: we will use our good faith efforts to get this money for New Mexico.

Thank you for the opportunity to address the committee, and I look forward to the testimony.

[The prepared statement of Senator Domenici and additional material referred to follows:]

# STATEMENT OF SENATOR PETE V. DOMENICI
# ON
# THE SECRETARY OF ENERGY'S DECISION PLAN ON WIPP
# AND
# THE DEPARTMENT OF ENERGY'S PLANS TO SUBMIT WIPP LAND WITHDRAWAL LEGISLATION TO THE CONGRESS

COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

APRIL 3, 1990

Mr. Chairman, our Nation's nuclear defense program has generated large quantities of transuranic waste. This waste, which primarily consist of objects contaminated by plutonium and other man-made radioactive elements, is currently being stored at temporary storage sites around the country, including Los Alamos National Laboratory in New Mexico.

The United States has pursued a policy to develop a method to permanently dispose of transuranic waste generated by national defense facilities at a site where they can be safely isolated from the environment. The Waste Isolation Pilot Plant (WIPP) in New Mexico is designed as an experimental facility to test that policy.

Since the WIPP project began, my number one concern has been the health and safety of New Mexicans.

If WIPP is to proceed, we must ensure that WIPP is safe and presents no threat to the health of the public. Health and safety problems that have recently come to light at other DOE facilities demonstrate that we cannot simply rely on the assurances of DOE that WIPP will be operated safely.

I have fought, through legislation and agreements with DOE, to assure that WIPP is safe and that New Mexico has a say in how the WIPP project is operated. At my insistence, New Mexico was the first State in the Nation to be given the right to have independent safety oversight of a nuclear defense facility, which gave rise to New Mexico's Environmental Evaluation Group. I have had to battle with DOE for many years to obtain funding to upgrade the roads over which trucks heading to the WIPP site must travel. When DOE attempted to loosen the safety standards for TRUPACT, the canister designed for the transport of waste to WIPP, I helped convince the Department of Transportation that DOE must comply with the Department of Transportation's strict radioactive waste shipping standards. When questions arose about brine seeping into WIPP, the National Academy of Sciences conducted an investigation at my request.

Last June, the Secretary of Energy announced that WIPP would not open until he and independent reviewers were satisfied that WIPP is safe. I commend Admiral Watkins for this decision, which signalled to the people of New Mexico that DOE is serious about the safety of the WIPP project.

Following that announcement, the Department of Energy (DOE) sought the independent review of various aspects of WIPP by the National Academy of Sciences, the Environmental Protection Agency (EPA), the Environmental Evaluation Group, the Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facilities Safety Board, and a five-member Secretary's Blue Ribbon Panel on WIPP.

In order to determine that WIPP is safe, Admiral Watkins developed a Decision Plan for WIPP, which identifies key activities that must be completed before WIPP can be opened and estimates the schedule for completion of these activities. For instance, DOE must:

- Finalize the Performance Assessment Plan for the Test Phase;
- Demonstrate compliance with EPA storage standards;
- Acquire the remaining potash lease at the WIPP site;
- Obtain State designation of the Preferred WIPP Transportation Routes;
- Complete emergency response activities;
- Obtain a Resource Conservation and Recovery Act (RCRA) No-Migration Variance from EPA;
- Approve the WIPP Final Safety Analysis Report;
- Issue an Addendum to the Final Safety Analysis Report;
- Prepare a report on Operations Demonstrations;
- Publish a Waste Retrieval Plan;
- Issue a Final Supplemental EIS;
- Prepare a Record of Decision on the EIS;
- Develop a Waste Characterization Plan;
- Prepare "critical as-built" drawings; and
- Complete an Integrated Systems Check-Out.

The decision whether and when to open WIPP is scheduled to made by Admiral Watkins in June based on the independent reviews of WIPP and the progress that has been made on completing the tasks identified in the Decision Plan.

The purpose of today's hearing is to receive testimony on the WIPP Decision Plan and on DOE's plans to submit land withdrawal legislation to the Congress.

Mr. Chairman, now is not the right time for Congress to consider land withdrawal legislation for WIPP because DOE has yet to complete a number of important tasks related to the protection of the public health and safety.

For instance, DOE still has not demonstrated that WIPP complies with EPA standards for the storage of radioactive waste, issued a final plan for experiments at WIPP during the Test Phase, obtained approval of the Final Safety Analysis Report, received final approval of the RCRA No-Migration Petition from EPA, determined whether to conduct an Operations Demonstration, characterized the WIPP waste, promulgated a retrieval plan for the WIPP waste, acquired the remaining potash lease at the site, or obtained State designation of the Preferred WIPP Transportation Routes.

Even if Congress were to pass a land withdrawal bill, WIPP cannot open until these health and safety tasks are completed. DOE also has not completed the WIPP safety and performance studies that the National Academy of Sciences, EPA, and the Advisory Committee on Nuclear Facility Safety requested.

The desire to enact a land withdrawal bill has spurred DOE to complete many health and safety tasks at WIPP. I wonder if DOE would continue its emphasis on completing the remaining health and safety tasks if Congress were to approve a land withdrawal bill at this time. I believe, therefore, that consideration of a land withdrawal bill should wait until DOE completes the health and safety tasks that are necessary before WIPP can open.

Mr. Chairman, I am also believe that DOE must meet its commitments to New Mexico regarding funding for the WIPP transportation system.

Under the 1982 Supplemental Stipulated Agreement between DOE and the State of New Mexico, 205.9 miles of roads in New Mexico were identified as in need of repair to serve as transportation routes to the WIPP site. Under the Agreement, DOE agreed to support appropriations for the upgrading of these roads.

To date, $54.4 million has been appropriated and spent for WIPP roads. An additional $43 million appropriated by the Congress in Fiscal Year 1989, pursuant to the WIPP road authorization in the 1987 Highway Act, is being withheld by DOE.

In 1987, DOE and the State of New Mexico entered into an agreement under which the parties agreed that certain bypasses and relief routes needed to be constructed to increase the safety of the WIPP transportation system by avoiding congestion and urban areas. The identified bypasses and relief routes are: the Santa Fe and Carlsbad bypasses and the Artesia, Hobbs, Los Alamos/Santa Fe, and Roswell relief routes. The agreement specifically noted that funding for the roads was "immediately needed."

DOE agreed to make a "good faith effort" to support an appropriation of $190 million (in 1987 dollars) for these relief routes and bypasses. A "good faith effort" was defined, in part, as testifying before Congress in support of the authorization and appropriation of these funds and responding favorably in support of the roads to public inquiries.

This Committee recognized the Federal Government's commitment to funding the WIPP relief routes and bypasses when it approved a $200 million authorization for these roads in 1988.

Recently, there have been some indications that DOE is opposed to any additional WIPP road funding for New Mexico, including funding for the bypasses and relief routes.

I understand the difficulty in obtaining this funding from the DOE budget, but I don't understand how DOE, in light of its previous commitments to the people of New Mexico, can do anything but indicate its support for the authorization and appropriation of funding for the construction of the Santa Fe and Carlsbad bypasses and the Artesia, Hobbs, Los Alamos/Santa Fe, and Roswell relief routes. In addition, I believe that DOE must immediately release to the State of New Mexico the $43 million appropriation for WIPP roads that the Congress provided.

Mr. Chairman, we must place the safety of WIPP before all other considerations. I am committed to assuring before WIPP opens that WIPP is safe and presents no threat to the health of the public. And that means that all health and safety protections should be in place before the Congress considers a WIPP land withdrawal bill.

## AGREEMENT BETWEEN THE STATE OF NEW MEXICO AND THE DEPARTMENT OF ENERGY

WHEREAS, the State has identified the necessity of constructing a number of new roads in New Mexico along the designated WIPP transportation routes to provide relief routes around congested urban areas and away from frequently traveled existing routes;

NOW THEREFORE, the parties agree to the following amendments to the 1982 Supplemental Stipulated Agreement, which is a part thereof, in the following particulars:

The D.O.E. agrees that, with the support of the New Mexico Delegation, which support State officials will solicit in furtherance of implementing this Agreement, the D.O.E. will make a good faith effort immediately to join and support the State and its Delegation in seeking a special appropriation from Congress of an amount not to exceed $190,000,000.00 (1987 dollars) for the purpose of assisting the State in the construction of the following new roads in New Mexico that the New Mexico State Highway Department has proposed for funding as WIPP project relief routes:

1) a Hobbs Relief Route;
2) a Los Alamos/Santa Fe Relief Route;
3) a Roswell Relief Route;
4) a Santa Fe By-pass;
5) an Artesia Relief Route; and
6) a Carlsbad By-pass (Eddy County Loop Route).

The State and the D.O.E. recognize that such funding may be appropriated over a number of years. Given the D.O.E.'s plan to start emplacing waste at WIPP in October 1988, the funding is immediately needed for construction of these relief routes before a substantial portion of the waste starts being transported on New Mexico highways.

A "good faith effort" by the D.O.E. immediately to join and support the State and its Delegation to seek these funds from Congress includes at least the following:

1) The D.O.E. shall submit written testimony and testify if possible in support of the above mentioned requested appropriation and authorization before the Senate and House Appropriations Committees, the Senate Environment and Public Works Committee, the House Public Works Committee, the Senate and House Budget Committees, and any other appropriate Congressional committees;

2) The D.O.E. shall submit written statements in favor of the above mentioned requested appropriation and authorization to all members of the New Mexico Delegation for their use;

3) The D.O.E. shall coordinate and cooperate with the Federal Highway Administration to enlist its support in favor of the above mentioned requested appropriation and authorization; and

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4) The D.O.E. shall respond favorably in support of the above mentioned requested appropriation and authorization to inquiries from the press, the public, and others.

Signed this 4th day of August 1987.

**SIGNATURES:**

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[In the U.S. District Court for the District of New Mexico, No. 81-0363 JB]

STATE OF NEW MEXICO, EX REL., JEFF BINGAMAN, ATTORNEY GENERAL OF THE STATE OF NEW MEXICO, PLAINTIFF, *vs.* THE U.S. DEPARTMENT OF ENERGY, ET AL., DEFENDANTS

## SUPPLEMENTAL STIPULATED AGREEMENT RESOLVING CERTAIN STATE OFF-SITE CONCERNS OVER WIPP

### *I. Introduction*

This Supplemental Stipulated Agreement is entered into by the United States Department of Energy and the State of New Mexico for the purpose of addressing the State of New Mexico's off-site concerns over the proposed construction and operation of the WIPP nuclear waste facility near Carlsbad, New Mexico. On July 1, 1981 the parties entered into a Stipulated Agreement under which D.O.E. committed to making a good faith effort to assist the State in resolving the State's off-site governmental concerns over WIPP through a State-Federal Task Force. The State of New Mexico and D.O.E. have completed their negotiations on the State's off-site concerns through this State-Federal Task Force and have entered into the following additional stipulations and agreements with respect to WIPP.

### *II. Scope of agreement*

This Supplemental Stipulated Agreement addresses the State's off-site concerns over WIPP in the four major areas of:

A. State liability;
B. Emergency response preparedness;
C. Independent monitoring of WIPP by the State; and the
D. Upgrading and repair of state highways.

The following agreements seek to finally resolve the State's off-site concerns although several aspects of certain issues remain to be negotiated by the parties at later dates according to the time schedules set forth in this Agreement. It is recognized by the parties hereto that the agreements and stipulations herein are contigent upon (1) a decision by D.O.E. to proceed to construct and operate a permanent waste facility as currently authorized by P.L. 96-164; and (2) Congressional funding therefor. (It is also noted that D.O.E. must obtain further land use authority pursuant to aplicable law prior to actual construction of the permanent waste facility). The D.O.E. has advised the State that a decision will be made after the completion of the SPDV construction and site validation phases in 1983 whether to construct and operate the permanent WIPP facility, and this Agreement does not serve to prejudge that decision by either party.

#### *E. Upgrading of state highways.*

1. *Summary of the State of New Mexico's Concerns.*—The State of New Mexico is concerned that based on the identification of probable transportation routes by D.O.E. for WIPP shipments in the Final Environmental Impact Statement for WIPP, certain portions of State highways may be used which are presently unsafe and substandard and must be repaired and upgraded. The State seeks to have D.O.E. assist the State in obtaining federal funding for the State to pay for the upgrading of those portions of State highways designated for WIPP shipments which are most in need of repair and for which State or federal appropriations are not otherwise available. The State has designated portions of the WIPP transportation routes which have the highest priority for repair based upon their substandard condition and the fact that almost all shipments must necessarily funnel down those highways. The State also seeks assurance that it shall not pay for the upgrading of any county roads or the construction of new roads in the vicinity of the WIPP site which may be used as access roads for the transportation of waste to WIPP.

2. *Stipulations and Agreements for Resolving the State's Concerns in the Area of Upgrading of State Highways.*

a) *Agreement by D.O.E. by Pay for Construction of New Roads and that the State Shall not Pay for Upgrading or Construction of County Access Roads Used to Carry Waste to the WIPP Site.*

The D.O.E. agrees that in the event any existing New Mexico county road in the vicinity of the WIPP site is used as an access road for the transportation of waste to WIPP, the State shall not be responsible for the cost of any upgrading of such roads which D.O.E. determines to be necessary in connection with such use. In the event a new road must be constructed for use as an access road for the transportation of waste to WIPP, D.O.E. shall pay for the construction of such new road.

b) *Agreement to Jointly Seek a 58 Million Dollar Special Appropriation From Congress for Upgrading of Certain New Mexico Highways.*

The D.O.E. agrees that, with the support of the New Mexico Congressional Delegation, which support will be solicited by the State officials in furtherance of implementing this Agreement, D.O.E. will make a good faith effort to join and support the State and its Delegation in seeking a special appropriation from Congress in the amount of $57,886,544.00 (1982 dollars) for the purpose of assisting the State in the timely upgrading and repair of the following described portions of New Mexico highways which have been determined by the State to be most in need of repair along the designated WIPP transportation routes: (Listed by order of priority.)

1. U.S. Highway 285 (FAP-023-3) from its junction with U.S. Highway 70 north of Roswell to junction with U.S. Highway 60 at Vaughn for a distance of 89.4 miles. Estimated cost: $25,700,000.00.
2. U.S. Highway 60-285 (FAP-027-1) from Encino toward Vaughn for a distance of 9.2 miles for an estimated cost of $2,760,000.00.
3. U.S. Highway 285 (FAP-050-1) from Torrance/San Miguel County line north and from White Lakes north for a distance of 19.8 miles for an estimated cost of $5,840,000.00.
4. U.S. Highway 60-285 (FAP-023-1) between Carlsbad and Loving for widening and resurfacing of 7.4 miles for an estimated cost of $2,710,422.00 and for resurfacing of 9.1 miles for an estimated cost of $1,386,122.00.
5. N.M. Highway 4 (FAP-054-1) from Pojoaque to the Rio Grande Bridge for a distance of 8.1 miles at an estimated cost of $2,430,000.00.
6. U.S. Highway 54 (FAP-20-3) from its junction with U.S. Highway 60 at Vaughn to junction with N.M. Highway 219 at Pastura for a distance of 32.2 miles at an estimated cost of $9,660,000.00.
7. U.S. Highway 62/180 (FAP-022-2) east of Carlsbad and three sections of U.S. Highway 285 (FAP-023-1) between Carlsbad and Roswell for a distance of 30.7 miles at an estimated cost of $7,400,000.00.

All as shown on Appendix B hereto. Total: 205.9 miles—$57,886,544.00.

The State recognizes that such funding may be appropriated over a four-year period commencing, ideally, four years prior to any waste being transported across these roads to State on a priority basis for those portions of highways most in need of repair with the highest risk of accident in the order of priority as set forth above.

*F. Funding amount adjustments*

The parties recognize that the level of funding for the commitments set forth herein are based upon 1982 dollars and the parties further recognize that the stated amounts herein will be adjusted for inflation at the time payment is made. All such commitments for funding are subject to the availability of appropriated funds.

*G. Modifications*

The parties recognize that the particulars of this Supplemental Agreement may be modified by the parties in the future by formal written agreement of the parties.

*H. Effect of this agreement*

This Supplemental Stipulated Agreement, as well as the prior Stipulated Agreement entered herein on July 1, 1981, resolves and settles, subject to the respective contingencies provided for therein and future compliance therewith, all of the issues raised in this litigation. Such agreements entered into between the State of New Mexico and D.O.E. in these proceedings constitute a full settlement of such issues. It is further agreed and recognized by the parties that this Supplemental Stipulated Agreement and the previous Stipulated Agreement of July 1, 1981, are binding contractual agreements the compliance with which is subject to the appropriate oversight jurisdiction of this Court. No provision in this Agreement shall be construed to prevent either the State of New Mexico or the United States from seeking further dispositive orders in this case at an appropriate future time.

The CHAIRMAN. Thank you very much, Senator Domenici.

Do any of the other Senators have comments?

Senator WIRTH. Mr. Chairman.

The CHAIRMAN. Senator Wirth.

## STATEMENT OF HON. TIMOTHY E. WIRTH, U.S. SENATOR FROM COLORADO

Senator **Wirth**. Thank you. Mr. Chairman. Senator Domenici very accurately and precisely stated that WIPP "will not be open until it is safe." And I understand that and support that, and that is absolutely correct.

WIPP is enormously important to us in Colorado, as Senator Bingaman and Senator Domenici know, for the storage of materials from the Rocky Flats Nuclear Weapons Plant, and for the storage of materials from Fort St. Vrain.

So it is very important to us, but Senator Domenici is absolutely right: It will not be open until it is safe.

This has got to be true, as well, for the Rocky Flats Nuclear Weapons Plant, which is currently not operating, as you know, Mr. Chairman. It was closed down and the Secretary has accurately stated that Rocky Flats also will not be open until it is safe.

Just as there are great pressures on the New Mexico delegation to open WIPP before the proper steps are taken, so we are facing a lot of pressures on Rocky Flats. The arguments have been made that if we do not open Rocky Flats somehow our national security is going to be endangered because we can build no more nuclear weapons.

Now, it is a bit difficult to understand that at a time when we have a dramatically changing relationship with the Soviet Union, and it is hard to believe that we are to endanger the health and the safety of the whole of the Denver Metropolitan Area because of a perception that somehow we have to build more nuclear weapons.

The argument is also made that you have to open Rocky Flats because it is the key to START. Well, there was an extraordinarily interesting article in this morning's "Washington Post" on what happens under START, how many more warheads we get under START than we have now.

It just seems to me that again we have to look at this dispassionately and carefully and understand what the implications are, and just as the New Mexico delegation is insistent upon a very careful and thoughtful and safe operation of WIPP, even though that opening is going to be good for us at Rocky Flats, we have to be very sympathetic with them and go along with them as well.

We have a similar kind of problem. We do not want in any way, shape or form to suggest that Rocky Flats be opened before it is safe as well.

I appreciate your having this hearing, Mr. Chairman. I appreciate the great problems that the Secretary is facing. Secretary Watkins has got an enormous job, as we all know, and we want to work as carefully as we can to make that process as safe and secure as we possibly can. Again, I thank you, Mr. Chairman, for your efforts.

The **Chairman**. Thank you, Senator Wirth.

Senator Ford.

Senator **Ford**. I have no statement, Mr. Chairman.

The **Chairman**. First this morning we will hear from our very distinguished colleague from the House of Representatives, Joe Skeen, who represents the area of New Mexico in which WIPP is located. Congressman Skeen, welcome to the Committee. Please proceed.

## STATEMENT OF HON. JOE SKEEN, U.S. REPRESENTATIVE FROM NEW MEXICO

Mr. **Skeen**. Thank you Mr. Chairman and members.

WIPP resides in my district in New Mexico. I have been acquainted with this facility from its very inception since the early 1970s and I am here not in frustration but with everlasting patience, and that is very hard to come by these days.

I am not here to praise WIPP, but I am here to see that what is going to be done to start burying transuranic waste in a safe repository.

My support for this project is no secret. My confidence that WIPP will become the Nation's first experimental facility and permanent repository for nuclear waste is no secret, and after today I hope it is no secret that I believe the Department of Energy, while making tremendous progress—and I have to commend Admiral Watkins for his leadership—we still have a lot of work to do in helping to ensure that Congress acts in a timely manner in considering land withdrawal legislation.

I cannot believe, with the scientific expertise that we have at the Department of Energy and the numerous talented individuals who are providing oversight and comment on the project, that WIPP will not open. I am unaware that any scientific group with expertise on this issue has stated that WIPP can never be safe.

What is needed is to commence work at the WIPP facility to test methods by which we can prove and demonstrate the safe handling, storage and permanent disposal of this waste. To think the Nation which created the nuclear age is unable to adequately and safely dispose of the waste it has generated is ludicrous. We would be much closer to solving our nuclear waste problem if the doomsayers who have for years said WIPP cannot open and cannot work would start focusing their attention on how we are going to deal with this pending environmental crisis, and it is a crisis.

But unfortunately the naysayers are not the only ones holding back progress on WIPP.

For every two steps the Department of Energy takes forward on WIPP they invariably seem to take one step back. By doing this the Department is veering off-track, losing sight of what must be done to open WIPP and the animosity towards the Department of Energy that is created by this missteps is unfortunate and avoidable.

The perception of the people of New Mexico—and let me emphasize the word "perception"—is that the Department of Energy is not interested in fulfilling promises made to the State, and I do not believe they mean to do that. The perception of the Department's lack of good faith is hurting efforts to focus on other important issues involving WIPP.

Statements made by Secretary Watkins last week before the House Armed Services Committee is the most recent example of the Department's credibility problem within our State.

Press accounts of the Secretary's views on compensation to New Mexico has created the perception that the Department is not interested in helping New Mexico obtain funds that can be used for WIPP-related road projects, and I am pleased that Senator Domenici has entered that agreement into the record, because it is there, it has been operative, and we have been operating under that kind of an agreement or understanding for some time.

This problem is compounded because of an agreement reached nearly three years ago between the Department and the State of New Mexico. It is general knowledge in the State that the Department signed an agreement that at the very least indicates that the Department will take every opportunity to support adequate funding for these road projects.

It is unfortunate the Department is having to spend its valuable time to explain its position on compensation. I thought that we had settled this issue years ago. The resources of the Department can be better spent tackling the scientific and engineering problems that still must be addressed.

It is my understanding that sometime today the Department of Energy will present its version of land withdrawal legislation to Congress. I have no problem with the Department coming up with its own legislation. I just hope the Department has made some much-needed changes to the proposed bill I saw several weeks ago.

In legislation I introduced last year with my colleague Richard Stallings, the Department agreed to provisions on State compensation, banning high-level waste, establishing maximum limits on the amount of waste that can be sent to WIPP, establishing priorities in waste shipments and other important safety provisions. To veer from this would also strike a blow at the Department's credibility in New Mexico.

The Department must still settle an outstanding mining claim with IMC Fertilizer that has been pending for years. The question of a no-migration petition, finalizing transportation and emergency response readiness and other issues also need to be answered.

The point I am trying to make is that the Department needs to do a better job at reading the road map that leads to the opening of WIPP. While the Secretary's decision plan for WIPP has helped a great deal, unnecessary detours along the way continue. These detours only compound the problems that the project currently faces.

A few weeks ago a reporter asked me if I thought WIPP would open in 1990. I answered that given the current circumstances the chances of WIPP opening this year were slim to none and slim just left town.

Let us show Slim the road back toward town. Let us find the right path to take to ensure the Department of Energy and Congress acts responsibly toward making WIPP the Nation's first operational nuclear waste test facility and repository.

Mr. Chairman, I want to thank you and the members of this Committee once again for the opportunity to appear before you. If you have any questions, I will be pleased to try to answer those. If not, I will get out of your way and let somebody else talk.

The CHAIRMAN. Thank you very much, Congressman Skeen.

Senator Domenici.

Senator DOMENICI. I just want to thank the Congressman for his testimony.

The CHAIRMAN. Senator Bingaman?

Senator BINGAMAN. I will do the same. We have worked in the trenches a long time on this project and we appreciate the leadership that Congressman Skeen has shown in this.

Mr. SKEEN. We get very high marks for patience, Mr. Chairman. Thank you.

The CHAIRMAN. Senator Ford, did you have any questions?

Senator FORD. I will just thank him for the new joke. I will use that.

Mr. SKEEN. If that is a new joke, Senator.

Senator FORD. But see, it takes three days for it to get back to where I live. [Laughter.]

Mr. SKEEN. You have the same kind of mail service I have.

Senator FORD. That is about right.

Mr. SKEEN. Thank you, Senator.

The CHAIRMAN. Thank you very much. Next we have a very distinguished panel. We do not ordinarily get the opportunity to have such a distinguished group here, but Admiral Watkins and Secretary Lujan will both appear jointly and I am not going to referee who is going to go first. Rather, I am going to ask our two distinguished Secretaries who would like to be first.

Secretary WATKINS. I will defer to seniority.

Secretary LUJAN. I think mine is shorter, Mr. Chairman, so maybe for that reason.

## STATEMENT OF HON. MANUEL LUJAN, JR., SECRETARY, DEPARTMENT OF THE INTERIOR

Secretary LUJAN. Mr. Chairman, I have a longer statement which I have submitted to the Committee and I would like the opportunity to just summarize what I have included for the record, if that is agreeable with the Committee.

The CHAIRMAN. Yes, indeed.

Secretary LUJAN. Mr. Chairman, the Department of the Interior has consistently advocated a permanent congressional withdrawal of the WIPP site before transuranic nuclear waste is stored in the facility.

Under FLPMA, the Secretary of the Interior is authorized to make withdrawals exceeding 5,000 acres—the WIPP site encompasses 10,240 acres—for a period of only 20 years, although extension of that time period for an additional 20 years is also authorized. Thus, the withdrawal concept in FLPMA envisions that the lands withdrawn will to a large extent be somewhat suitable for return to their former status in public land uses at the conclusion of the withdrawal.

The projected term of the use of the reserved site for WIPP will extend long beyond the 20-year period of use that the Secretary may authorize under FLPMA. WIPP would have a projected operating period of 25 years followed by a decommissioning period. After decommissioning, active and passive controls would have to be implemented and maintained by DOE to ensure compliance with EPA performance standards.

Additionally, administrative land withdrawals do not address the health and safety concerns that have been raised in conjunction with this project. The most appropriate course of action would be to have the lands withdrawn and transferred permanently to DOE by the Congress.

While I have not ruled out an administrative withdrawal of limited scope to meet DOE's most immediate needs, I reaffirm my belief that legislative action ultimately will be required to fully meet the needs of both our Departments and to better provide for carrying out the WIPP objectives.

Toward that end, Mr. Chairman, we will continue to work with DOE to ensure passage of the Administration's legislative proposal that will permanently transfer lands needed for the WIPP project to the jurisdiction of DOE.

Thank you, Mr. Chairman.

[The prepared statement of Secretary Lujan follows:]

APR 3 1990

## STATEMENT OF MANUEL LUJAN, JR., SECRETARY OF THE INTERIOR, BEFORE THE COMMITTEE ON ENERGY AND NATURAL RESOURCES, UNITED STATES SENATE, ON WITHDRAWAL OF PUBLIC LANDS SURROUNDING THE WASTE ISOLATION PILOT PLANT SITE

I appreciate the opportunity to meet with you today to discuss land withdrawal issues associated with the Waste Isolation Pilot Plant Project, known as "WIPP", in Eddy County, New Mexico. I will also give you my views on the necessity for legislation to accomplish the permanent withdrawal.

The Department of the Interior has consistently advocated a permanent congressional withdrawal of the WIPP site before transuranic nuclear wastes are stored in the facility. Through the Bureau of Land Management (BLM), we have been involved with the preliminary discussions and the WIPP proposal since 1973 when some initial site studies were authorized by a cooperative agreement. In 1976, the first withdrawal application was filed for 17,200 acres of public land for studies for a possible WIPP site. In 1980, an environmental impact statement was completed and a modified withdrawal application filed on 8,960 acres to protect the four square miles surrounding the proposed facility.

In March 1982, an 8-year administrative withdrawal embodied in Public Land Order 6232 was granted on the 8,960 acres to allow for finalization of the Site Preliminary Design Validation. When this validation was completed in 1983, another 8-year administrative withdrawal was granted by Public Land Order 6403 to permit full construction of the facility. This withdrawal action applied to the 8,960 acres of public land, and specifically stated that the order would not authorize use or occupancy for transportation, storage, or burial of any radioactive materials.

In May, 1988, the BLM completed the acquisition of 1,280 acres of State land, so the entire 10,240 acres of the WIPP site is now Federal land managed by BLM.

The only outstanding land issue relating to the WIPP site relates to potash leases on the lands. It is our understanding that the Department of Energy is currently negotiating with the lessees on that matter.

By early 1989, with the construction phase nearing completion, the Department of Energy applied for a modification of the 1983 withdrawal order to authorize a test program using radioactive waste at the site, to delete the prohibition on transportation, storage, and burial of radioactive material, to increase DOE's exclusive control from 640 to about 1450 acres, and to extend the term through the end of June 1997. The Final Supplement to the Environmental Impact Statement covering the requested change of use of the withdrawal has been completed and notice of its availability was published in the Federal Register on February 2, 1990.

At this point, I will digress for a moment to discuss the withdrawal concept and its suitability for a project such as WIPP. Under the Federal Land Policy and Management Act of 1976 (FLPMA), the term "withdrawal" is defined as withholding an area of Federal land from settlement, sale, location and entry, under the general land laws. The definition states that this would be done to limit activities under those laws in order to maintain other public values in the area or to reserve the area for a particular public purpose or program. It also encompasses transferring jurisdiction over an area of Federal land from one Federal agency to another.

Under FLPMA, the Secretary of the Interior is authorized to make withdrawals exceeding 5000 acres for a period of only 20 years, although extension of that time period for an additional 20 years is also authorized. Thus the withdrawal concept in FLPMA envisions that the lands withdrawn will, to a large extent, be somewhat suitable for return to their former status and public land uses at the conclusion of the withdrawal.

If WIPP can be shown to be in compliance with applicable regulations, it would have a projected operating period of 25 years, to be followed by decommissioning. Following decommissioning, active and passive controls must be implemented and maintained by DOE to ensure that the EPA performance standards are met. Because the projected term of use of the reserved site will extend long beyond the 20-year periods of use that the Secretary may authorize under FLPMA, the most appropriate course of action would be to have the lands withdrawn and transferred permanently to DOE by the Congress. Also administrative land withdrawals do not address the health and safety concerns that have been raised in conjunction with this project.

The BLM has responded to the DOE request for an administrative withdrawal application by beginning the administrative process and will continue to do so until DOE or the Congress instruct us differently.

In summary, while I have not ruled out an administrative withdrawal of limited scope to meet DOE's most immediate needs, I reaffirm my belief that legislative action ultimately will be required to fully meet the needs of both our Departments and to better provide for carrying out the WIPP objectives. Toward that end, we will continue to work with DOE to ensure passage of the Administration's legislative proposal that will permanently transfer lands needed for the WIPP Project to the jurisdiction of DOE.

Thank you for the opportunity to give you my perspective on this important project as it relates to management of the lands and resources for which my Department is responsible.

I will be happy to answer questions.

The CHAIRMAN. Thank you very much, Mr. Secretary.

Admiral Watkins.

## STATEMENT OF HON. JAMES D. WATKINS, SECRETARY, DEPARTMENT OF ENERGY, ACCOMPANIED BY LEO DUFFY, DIRECTOR, DIVISION OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

Secretary WATKINS. Thank you, Mr. Chairman.

I appreciate this opportunity to appear before you today and discuss the very important Waste Isolation Pilot Plant near Carlsbad, New Mexico, and the Department of Energy's proposed legislation entitled The Waste Isolation Pilot Plant Land Withdrawal Act.

I have with me today Mr. Leo Duffy, who is my Director of my newly established division on environmental restoration and waste management, who is my expert on matters involving WIPP.

Enactment of the legislation would preclude the need for extension and modification of the current administrative land withdrawal and allow important tests to be conducted at WIPP. And only after completion of such a test program will there be sufficient valid data to support a determination that the WIPP facility could be a suitable waste depository.

As I testified before this committee in March of this year, I made a number of commitments last June with regard to nuclear waste management and protection of public health, safety and the environment. At that time, the Department had anticipated the WIPP would be ready to receive waste for the test phase by the fall of 1989.

After my summer meeting in June with the National Academy of Sciences, I concluded, based on a better understanding of the technical concern regarding WIPP, that I needed to undertake my own assessment of the program.

In fact, it brought all programs in the Department under complete review. And I was not pleased with the results of my review of those programs, and it took me until the fall to get my arms around a plan that would be suitable from all vantage points to deal with the Waste Isolation Pilot Plant.

I also decided that I would not be driven by previously set schedules. And since then, two important accomplishments have been realized. The first, we established the blue ribbon panel to review the technical and programmatic concerns. The members submitted their reports to me in October of last year, and their guidance has resulted in substantial improvements to the program in helping me prepare the Waste Isolation Pilot Plant road map.

The second key accomplishment was establishment of an adequate baseline of information, which will allow me tc make informed judgments. And in October of 1989, the Department prepared that draft plan and published it for public comment.

We solicited comments from governors, congressional delegations, the New Mexico Environmental Evaluation Group, the Environmental Protection Agency, the Departments of Defense and Interior, the Advisory Committee on Nuclear Facility Safety, and other interested parties.

We are now at revision 2-alpha of that plan, just published. And in June of 1990, I expect to be able to announce the status of WIPP's readiness to receive waste for the testing program.

At that time, there will be some outstanding prerequisites that will not have been completed. For example, the Environmental Protection Agency will not have made its final record of decision on our no-migration petition under RCRA. But we will have the results of the public comments on their proposed determination.

Obviously, I will not make a final decision on WIPP's readiness to receive waste until I am confident that these pre-operational activities, many of which are outside the Department's control, have been completed.

There have been changes to the schedule that I released in October and there will probably be more. But I think we are narrowing down now the number of remaining obstacles that we have in front of us.

Significant progress has been made. And in completing many of the prerequisites to initiation of the testing program, they have included, in August 1989, the Nuclear Regulatory Commission granting of a certificate of compliance for the TRUPACT II Waste Shipping Container.

These containers are now being manufactured, and the related equipment being procured. Progress in reaching cooperative transportation arrangements with the states and Indian tribes along the routes from DOE facilities to WIPP is being made.

In January of 1990, over 2,000 copies of the final supplement to the Waste Isolation Pilot Plant Environmental Impact Statement were distributed to Congress, state and federal agencies, and interested individuals. And I expect to sign the record of decision shortly.

I have determined, however, that the operations demonstration will be conducted only if DOE has a high level of confidence that disposal will comply with EPA disposal standards and other applicable regulations, and if additional operational experience with waste is needed beyond the performance assessment experiments.

This determination could occur three or four years after initiation of the initial test phase. We have had reviews of the final safety analysis report by the DOE's Office of Safety, Health and Quality Assurance. In addition, reviews have been conducted by the Advisory Committee on Nuclear Facility Safety, New Mexico Environmental Evaluation Group, and the New Mexico State Environmental Improvement Division.

Consistent with my concern for safety, approval of the final safety analysis report and the subsequent addendum for the test phase will take place here at headquarters, not in the field.

A final activity requiring significant effort over the past year has been the preparation and submittal of a no-migration petition to EPA under RCRA. A favorable decision by the Environmental Protection Agency is a critical prerequisite for WIPP, and would be consistent with DOE's conclusion that there will be no migration of waste from the repository.

I have been assured personally by Administrator William Reilly that consideration of DOE's petition has his agency's highest priority.

We also expect that the Environmental Protection Agency will grant the New Mexico Environmental Improvement Division authority to regulate waste sent to WIPP that contains hazardous constituents by mid-1990.

Turning now from discussing the status of the Decision Plan, I would like to address four specific areas of concern with WIPP, and the steps that have been taken to address them.

When I became Secretary, waste management activities were being conducted throughout the Department under larger programs with far broader missions. WIPP, for example, was under the Office of Nuclear Materials Production under Defense Programs.

I have established a separate office reporting directly to me now, which consolidates all of these activities and ensures the appropriate level of management attention. And Mr. Duffy heads that division.

In this connection, I agreed with many who said the Department seemed to be rushing to open WIPP in order to avoid a shutdown of Rocky Flats. Any repeat of this situation is now precluded because the two programs have been separated.

The primary reason for proceeding with the proposed test phase is to determine WIPP's suitability as a disposal facility.

A second area of concern is external oversight. The roles of the National Academy of Sciences WIPP Panel and the Environmental Evaluation Group are well known to this committee. Both organizations have been providing independent review of the WIPP facility for more than 10 years, and both have made significant contribution to the program through their recommendations and suggestions.

DOE and the WIPP Panel now agree that the 26 outstanding recommendations identified in June have been or are being addressed satisfactorily.

EPA has also been reviewing key project documents pertaining to compliance with its standards for radioactive waste disposal. This is in addition to their regulatory authority under the RCRA.

Other external groups involved in WIPP oversight include New Mexico's Environmental Improvement Division, the Advisory Committee on Nuclear Facility Safety, newly established by the Congress, and the Defense Nuclear Facility Safety Board, and the blue ribbon panel.

In addition, transportation activities are subject to Nuclear Regulatory Commission and Department of Transportation requirements.

A third area with which I have been concerned is safety and environmental protection, including operational safety and our confidence in expected long-term performance of the repository.

With regard to operational safety, over the past 18 months, WIPP has been subjected to numerous audits, reviews and appraisals, resulting in over 1,000 findings and recommendations. DOE is preparing detailed responses and implementing corrective actions where necessary.

In addition, DOE will comply with EPA's environmental protection standards applicable to the storage of waste during the test phase. One of the major environmental protection issues is whether

WIPP can comply with the disposal standard for transuranic waste. This standard applies to the performance of the repository in the long term after waste emplacement has been completed.

Some people believe that DOE must comply with this standard prior to beginning the test phase. However, the EPA disposal standard is not applicable until the determination is made that WIPP will be a disposal facility after the test phase.

Several external reviews have recommended that DOE should have reasonable confidence now that WIPP can, in due course, be shown to meet the disposal standard. As a result, Sandia National Laboratories is preparing an assessment of WIPP's long-term performance. This basis for judging reasonable confidence will be available this June.

In addition to enhancing our ability to comply, we now have an accelerated effort underway to identify test potential engineered modifications to the existing waste forms and repository design during the test phase.

My final concern is the amount of waste to be emplaced in WIPP. Ten years ago, project planning for the test phase envisioned a much different concept than I am now recommending. DOE assumed that retrievable emplacement of waste at operational throughput rates would be demonstrated for approximately five years, and then a decision would be made on the acceptability of a permanent emplacement.

When I reviewed the test plan in April of last year, I decided that the minimum level would be based on a scientific evaluation by the EPA, the National Academy of Sciences, the Environmental Evaluation Group, and the blue ribbon panel. The results of the review support emplacing limited amounts of waste to provide information to assess performance and operational capabilities.

After considering comments resulting from this external review, I have concluded that up to approximately 2 percent of WIPP's design capacity could be required during the test phase. The 2 percent includes approximately .5 percent for bin scale and alcove tests, approximately 4,500 drums, which are supported by the National Academy of Science, the EEG, the Environmental Protection Agency, and the blue ribbon panel.

In addition, the Environmental Protection Agency has recommended that the performance of the facility be monitored by emplacing waste in two full-scale instrumented backfill-sealed rooms. This would require approximately 1.5 percent of the WIPP design capacity, the total then being 2 percent.

DOE will conduct a feasibility study and consult with external review groups prior to deciding the extent of the testing with regard to the two pilot programs.

Under EPA's proposal, DOE will require a modification to its petition before emplacement of waste in these pilot rooms as currently envisioned. That is, backfilled without stand-off walls. If EPA proposes to approve this modification, it will be subject to notice and comment in the Federal Register.

I want to stress that while we anticipate having WIPP ready to receive waste for the test phase in the near future, it could take up to five years or more to review the performance assessment data and determine whether WIPP could be an operational facility.

We must complete the test phase and show compliance with EPA standards.

To put this concern with waste quantities in perspective that perhaps we could all better understand, I will use a different reference point. Two years ago, waste volumes anticipated for the test phase would have required approximately 3,000 TRUPACT trailer shipments. Current plans would require about 400 shipments for the bin scale and alcove tests, and the pilot rooms proposed by EPA, if implemented.

All waste in place prior to meeting the EPA disposal standards will be fully retrievable.

I have discussed the status of the decision plan and the actions which have been taken to address major concerns with WIPP, and now I would like to turn to the need for land withdrawal.

DOE has proceeded with a phased development of WIPP under two successive administrative land withdrawals. The current order does not allow DOE to place radioactive waste on the WIPP site lands for any purpose. The next phase of the proposed action during which experiments would be conducted to determine whether WIPP can be used as a permanent repository would utilize transuranic waste at WIPP.

Accordingly, the DOE has submitted an application to permit the receipt of radioactive waste on-site for the test experiments.

In addition, the Administration will submit proposed legislation today in an effort to, one, promote enactment by the Congress of permanent land withdrawal legislation, preclude the need for extension and modification of the current administration WIPP land withdrawal, and allow important test programs to be conducted at WIPP.

DOE believes legislation is the proper method to use to achieve land withdrawal for the future phased development of WIPP. In my previous testimony before Congress and in numerous public statements, I have said that I will not permit waste receipts at WIPP until I am certain it is safe.

To emphasize this point I have included in my legislative proposal specific conditions that the Department must meet before land withdrawal could take effect. These conditions include completion of the final safety analysis report and the supplemental environmental impact statement, and issuance of the no-migration petition by the Environmental Protection Agency.

The legislative proposal also requires compliance with EPA standards for management, storage and disposal of transuranic waste. In addition, the proposal includes provisions for providing the Department to, one, encourage business and employment activities in the State of New Mexico.

These would include such things as assembly of TRUPACT containers, the manufacture of standard waste boxes, proposed environmental monitoring and research centers, and a procurement seminar.

Two, provide payments equivalent to taxes to the state and units of local government in which the land withdrawal is located. These are new concept procedures and they are being developed. And that can certainly be negotiated with you all here on Capitol Hill.

And three, complete negotiations related to a potash lease in the vicinity of WIPP. That is in confidential negotiations now with IMC, Inc., and we are hopeful that that will be resolved in the near future.

It should be noted that when legislative land withdrawal takes effect, the Department will also provide to the State of New Mexico funds in the amount of approximately $43 million in currently appropriated funds for highway improvements. This is in addition to some $50-plus million that were provided between the years 1983 and 1987.

In conclusion, based on the progress achieved in recent months on WIPP, I believe we are making strides this year towards completion of all pre-operational activities, and since 1975, when the site for WIPP was selected, we have conducted a comprehensive program of site characterization and associated research and development without the use of waste.

There have been several new and changed requirements in the interim period, such as compliance with RCRA, the need for a no-migration petition, a 10,000 year disposal standard, a revised design for the shipping container, and the need for significant additional testing.

We have made progress in all of these areas. To support a determination of compliance with EPA's disposal standards, DOE must proceed to conduct performance assessment tests with transuranic waste at WIPP.

As I have stated earlier, the National Academy of Science and other reviewers support the initiation of this test with the bin scale and alcove tests. We need to get on with the next phase of WIPP now, but this will not occur until I am assured that safety, state and federal regulatory requirements are met, and, of course, land withdrawal is already passed by the Congress.

The land withdrawal legislation that the Administration is submitting today to the Congress contains the safeguards necessary to assure Congress that the withdrawal will not be effective until the Department meets its commitment to bring waste to WIPP in a safe manner.

I believe it is critical that the Congress expeditiously act to pass land withdrawal legislation prior to the end of this legislative year. The passage of this legislation this year will demonstrate real progress towards a solution to the disposal of this Nation's nuclear waste.

And I will stand by to answer any questions you may have.

[The prepared statement of Secretary Watkins follows:]

# STATEMENT OF
# JAMES D. WATKINS, ADMIRAL, U.S. NAVY (RETIRED)

# SECRETARY OF ENERGY

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

APRIL 3, 1990

I am pleased to appear before you today to discuss the status of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, and the Department of Energy's (DOE) proposed legislation entitled the "Waste Isolation Pilot Plant Land Withdrawal Act." Enactment of this legislation would preclude the need for extension and modification of the current administrative land withdrawal and allow important tests to be conducted at WIPP. Only after the completion of such a test program will there be sufficient valid data to support a determination that the WIPP facility could be a suitable waste repository.

As I testified before this Committee in March 1990, I made a number of commitments last June with regard to nuclear waste management and protection of the public health, safety, and environment. At that time, the Department had anticipated that WIPP would be ready to receive waste for the Test Phase program in the fall of 1989. After meeting with the National Academy of Sciences, I concluded - based on a better understanding of the technical concerns regarding WIPP - that I needed to undertake my own assessment of the program. I also decided that I would not be driven by previously set schedules. Since then, two important accomplishments have been realized.

The first was the establishment of a Blue Ribbon Panel to review technical and programmatic concerns. The members submitted their reports to me in October 1989 and their guidance has resulted in substantial improvements to the program especially in the areas of waste characterization and program integration.

The second key accomplishment was the establishment of an adequate baseline of information which will allow me to make informed judgments. In October 1989, the Department prepared a draft Decision Plan on WIPP which identified the activities that need to be completed satisfactorily prior to WIPP receiving waste, the process for conducting these activities, and an estimate of the time required for their completion. DOE solicited comments on this Plan from Governors and Congressional delegations, the New Mexico Environmental Evaluation Group, the Environmental Protection Agency, the Departments of Defense and the Interior, the Advisory Committee on Nuclear Facility Safety, and other interested parties.

In June 1990, I expect to announce the status of WIPP's readiness to receive waste for the testing program. At that time there will be some outstanding prerequisites that will not have been completed. For example, the Environmental Protection Agency will not have made its final decision on our No Migration Petition under the Resource and Conservation Recovery Act, but we will have the results of the public comments on their proposed determination. Obviously, I will not make a final decision on WIPP's readiness to receive waste until I am confident that these preoperational activities -- many of which are outside the Department's control -- have been completed. There have been changes to the schedule that I released in October 1990 and there could be more changes. These changes result from my insistence that management decisions be based on sound technical studies, complete reviews and adequate public confidence.

Significant progress has been made, however, in completing many of the prerequisites to initiation of the testing program. In August 1989, the Nuclear Regulatory Commission granted its Certificate of Compliance for the TRUPACT II waste shipping container. These containers are now being manufactured and the related equipment is being procured. Progress in reaching cooperative transportation agreements with the States and Indian tribes along the routes from DOE facilities to WIPP is being made. DOE is funding these agreements as a cooperative effort to address transportation issues.

In January 1990, over 2,000 copies of the Final Supplement to the WIPP Environmental Impact Statement were distributed to Congress, State and Federal agencies, and interested individuals. I expect to sign the Record of Decision shortly. I have determined, however, that the Operations Demonstration will be conducted only if DOE has a high level of confidence that disposal will comply with Environmental Protection Agency disposal standards and other applicable regulations and if additional operational experience with waste is needed beyond the performance assessment experiments. This determination could occur three or four years after initiation of the Test Phase.

We have had reviews of the Final Safety Analysis Report by the DOE's Office of Safety, Health and Quality Assurance. In addition, reviews have been conducted by the Advisory Committee on Nuclear Facility Safety, New Mexico Environmental Evaluation Group, and the New Mexico State Environmental

Improvement Division. Consistent with my concerns for safety, approval of the Final Safety Analysis Report and the subsequent addendum for the Test Phase will take place here at Headquarters.

A final activity, requiring significant effort over the past year, has been the preparation and submittal of a No Migration Petition to the Environmental Protection Agency under the Resource Conservation and Recovery Act. A favorable decision by the Environmental Protection Agency is a critical prerequisite for WIPP and would be consistent with DOE's conclusion that there will be no migration of waste from the repository. I have been assured personally by Administrator William Reilly that consideration of DOE's petition has his Agency's highest priority. We also expect that the Environmental Protection Agency will grant the New Mexico Environmental Improvement Division authority to regulate waste sent to WIPP that contains hazardous constituents by mid-1990.

Turning now from discussing the status of the Decision Plan, I would like to address four specific areas of concern with WIPP and the steps that have been taken to address them.

When I became Secretary, waste management activities were being conducted throughout the Department under larger programs with far broader missions. WIPP, for example, was under the Office of Nuclear Materials Production in Defense Programs. I have established a separate office reporting directly to me, which consolidates all of these activities and ensures the appropriate level of management attention. There was some perception that the Department was rushing to open WIPP in order to avoid a shutdown of Rocky Flats. The two programs are now clearly separate. The primary reason for proceeding with the proposed Test Phase is to determine WIPP's suitability as a disposal facility.

A second area of concern is external oversight. The roles of the National Academy of Sciences WIPP Panel and the Environmental Evaluation Group are well-known to this Committee. Both organizations have been providing independent review of the WIPP facility for more than 10 years and both have made significant contributions to the program through their recommendations and suggestions. DOE and the WIPP Panel now agree that the 26 outstanding recommendations identified in June have been or are being addressed satisfactorily.

The Environmental Protection Agency has also been reviewing key project documents pertaining to compliance with its standards for radioactive waste disposal. This is in addition to their regulatory authority under the Resource Conservation and Recovery Act. Other external groups involved in WIPP oversight include New Mexico's Environmental Improvement Division, the Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facilities Safety Board and the Blue Ribbon Panel. In addition, transportation activities are subject to Nuclear Regulatory Commission and Department of Transportation requirements.

A third area with which I have been concerned is safety and environmental protection - including operational safety and our confidence in the expected long-term performance of the repository. With regard to operational safety, over the past 18 months WIPP has been subjected to numerous audits, reviews and appraisals resulting in over 1,000 findings and recommendations. DOE is preparing detailed responses and implementing corrective actions where necessary. In addition, DOE will comply with the Environmental Protection Agency's environmental protection standards applicable to the storage of waste during the Test Phase.

One of the major environmental protection issues is whether WIPP can comply with the disposal standard for transuranic waste. This standard applies to the performance of the repository in the long term after waste emplacement has been completed. Some people believe that DOE must comply with this standard prior to beginning the Test Phase. However, the Environmental Protection Agency disposal standard is not applicable until a determination is made that WIPP will be a disposal facility after the Test Phase. Several external reviews have recommended that DOE should have reasonable confidence now that WIPP can in due course be shown to meet the disposal standard. As a result, Sandia National Laboratories is preparing an assessment of WIPP's long-term performance. This basis for judging reasonable confidence will be available this June. In addition, to enhance our ability to comply, we now have an accelerated effort underway to identify and test potential engineered modifications to the existing waste forms and repository design during the Test Phase.

My final concern is the amount of waste to be emplaced in WIPP. Ten years ago, project planning for the Test Phase envisioned a much different concept than what I am recommending. DOE assumed that retrievable emplacement of waste at operational through-put rates would be demonstrated for approximately 5 years and then a decision would be made on the acceptability of permanent emplacement. When I reviewed the proposed Test Plan in April, I decided that the minimum level would be based on a scientific evaluation by the Environmental Protection Agency, the National Academy of Sciences, the Environmental Evaluation Group and the Blue Ribbon Panel. The results of the reviews support emplacing limited amounts of waste to provide information to assess performance and operational capabilities.

After considering comments resulting from this external review, I have concluded that up to approximately 2 percent of WIPP's design capacity could be required during the Test Phase. The 2 percent includes approximately 0.5 percent for bin-scale and alcove tests (approximately 4500 drums) which are supported by the National Academy of Sciences, Environmental Evaluation Group, Environmental Protection Agency and the Blue Ribbon Panel. In addition, the Environmental Protection Agency has recommended that the performance of the facility be monitored by emplacing waste in two full-scale, instrumented, backfilled, sealed rooms. This would require approximately 1.5 percent of the WIPP design capacity. DOE will conduct a feasibility study and consult with external review groups prior to deciding the extent of testing with regard to the two pilot rooms. Under the EPA's proposal, DOE will be required to modify its Petition before emplacement of waste in these pilot rooms as currently envisioned (i.e., backfilled without standoff walls). If EPA proposes to approve this modification, it will be subject to notice and comment in the Federal Register. I want to stress that while we anticipate having WIPP ready to receive waste for the Test Phase in the near future, it could take 5 years or more to review the performance assessment data and determine whether WIPP could be an operational facility. We must complete the Test Phase and show compliance with the Environmental Protection Agency standard.

To put this concern with waste quantities in a perspective that perhaps we can all better understand, I will use a different reference point. Two years ago, waste volumes anticipated for the Test Phase would have required approximately 3000 TRUPACT II trailer shipments. Current plans would require about 400 shipments for the bin-scale and alcove tests and the pilot rooms proposed by the Environmental Protection Agency, if implemented. All wastes emplaced prior to meeting the Environmental Protection Agency disposal standards will be fully retrievable.

I have discussed the status of the Decision Plan and the actions which have been taken to address the major concerns with WIPP. Now I would like to turn to the need for land withdrawal. DOE has proceeded with the phased development of WIPP under two successive administrative land withdrawals.

The current Order does not allow DOE to place radioactive waste on the WIPP site lands for any purpose. The next phase of the Proposed Action, during which experiments would be conducted to determine whether WIPP can be used as a permanent repository, would utilize transuranic waste at WIPP. Accordingly, the DOE has submitted an application to permit the receipt of radioactive waste on site for the Test Phase experiments.

In addition, the Administration will submit proposed legislation in an effort to (1) promote enactment by the Congress of permanent land-withdrawal legislation; (2) preclude the need for extension and modification of the current administrative WIPP land withdrawal; and (3) allow important test programs to be conducted at the WIPP. DOE believes that legislation is the preferred method to achieve land withdrawal for the future phased development of WIPP.

In my previous testimony before the Congress and in numerous public statements, I have said that I will not permit waste receipts at WIPP until I am certain that it is safe. To emphasize this point, I have included in my legislative proposal specific conditions that the Department must meet before the land withdrawal could take effect. These conditions are:

- completion of the Final Safety Analysis Report and the Supplemental Environmental Impact Statement, and
- issuance of the No Migration Petition by the Environmental Protection Agency

The legislative proposal also requires compliance with Environmental Protection Agency standards for the management, storage, and disposal of transuranic waste. In addition, the proposal includes provisions providing for the Department to: (1) encourage business and employment activities in the

State of New Mexico; (2) provide payments equivalent to taxes to the State and units of local government in which the land withdrawal is located; and (3) complete negotiations related to a potash lease in the vicinity of WIPP.

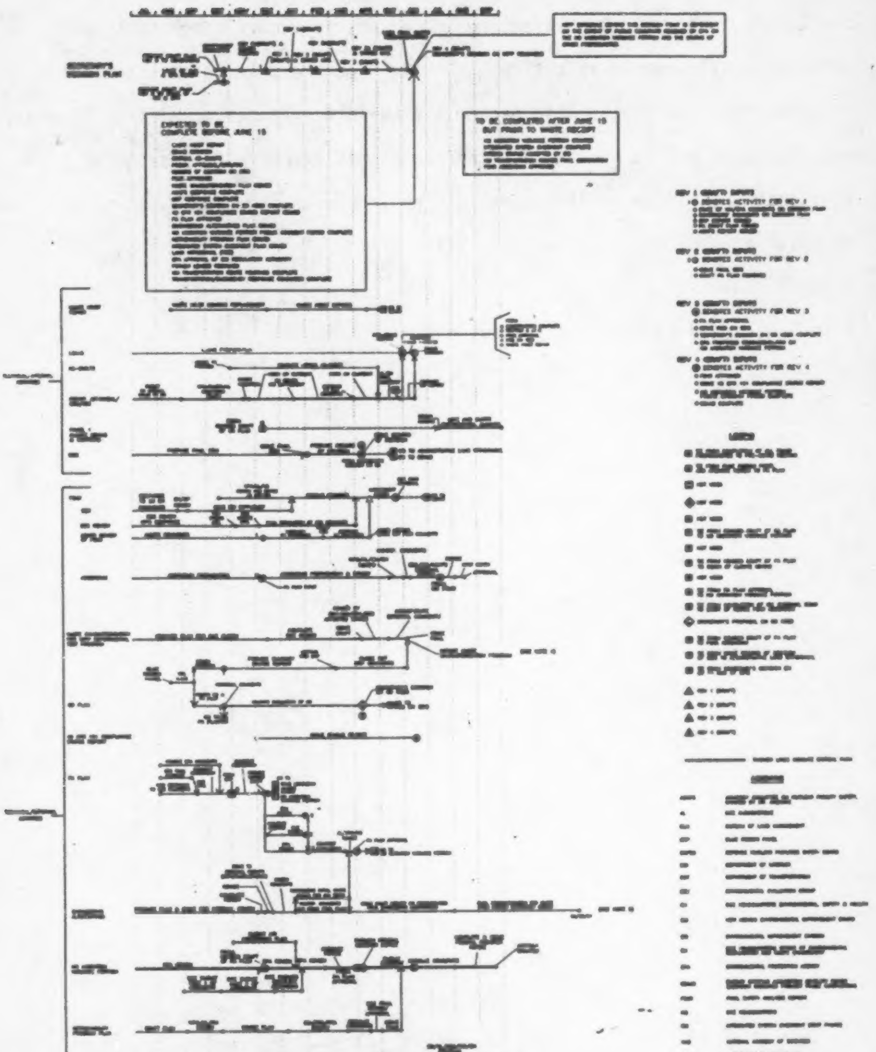
It should be noted that when legislative land withdrawal takes effect, the Department will also provide to the State of New Mexico funds in the amount of approximately $43 million in currently appropriated funds for highway improvements.

In conclusion, based on the progress achieved in recent months on WIPP, I believe we are making great strides this year towards completion of all preoperational activities. Since 1975, when the site for WIPP was selected, we have conducted a comprehensive program of site characterization and associated research and development without the use of waste. There have been several new or changed requirements in the meantime - such as compliance with the Resource Conservation and Recovery Act, and the need for a No Migration Petition, a 10,000 year disposal standard, a revised design for the shipping container, and the need for significant additional testing. We have made progress in all of these areas. To support a determination of compliance with the Environmental Protection Agency disposal standard, DOE must proceed to conduct performance assessment tests with transuranic waste at WIPP. As I have stated earlier, the National Academy of Sciences and other reviewers support the initiation of this Test Phase with the bin-scale and alcove tests. We need to get on with the next phase of WIPP now. But, this will not occur until I am assured that all safety, State and Federal regulatory requirements are met.

The land withdrawal legislation that the Administration is submitting today to the Congress contains the safeguards necessary to assure Congress that the withdrawal will not be effective until the Department meets its commitment to bring waste to WIPP in a safe manner. I believe it is critical that Congress expeditiously act to pass land withdrawal legislation. The passage of legislation this year will demonstrate real progress towards a solution to the disposal of this Nation's nuclear waste.

I will be happy to answer any questions.

DRAFT DECISION PLAN FOR WIPP
REV. 3A MARCH 16, 1990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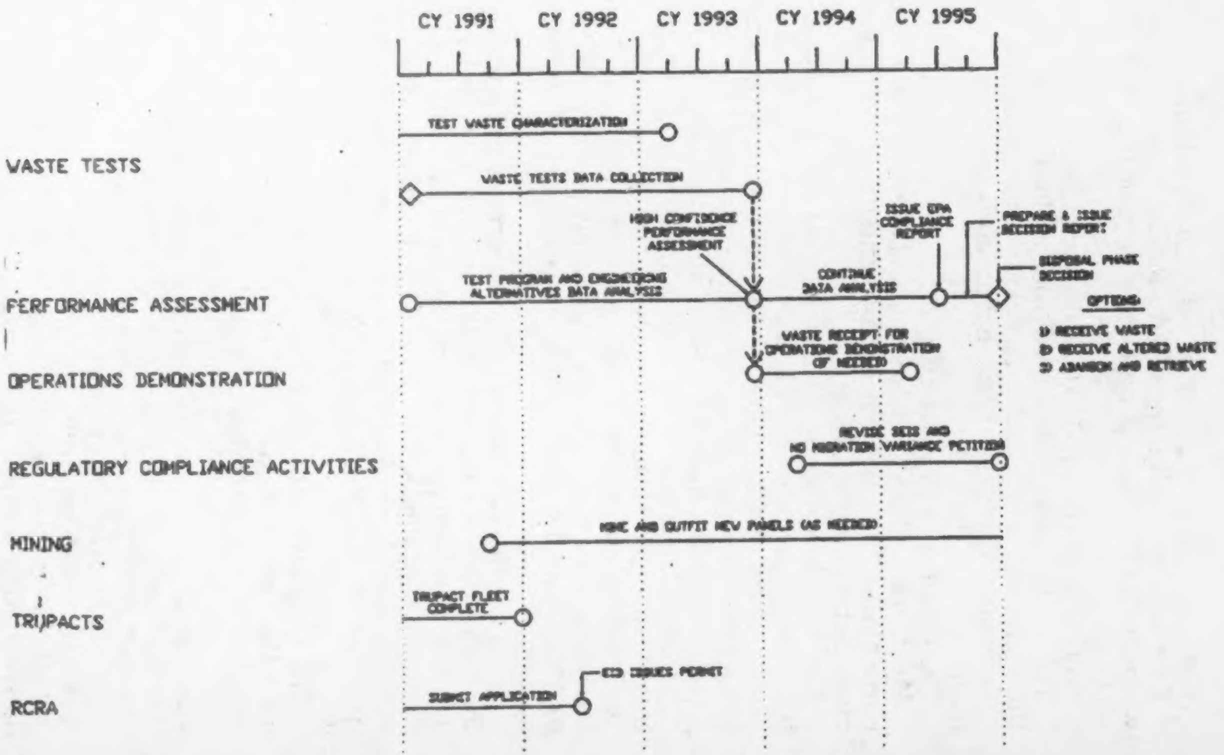
# DRAFT WIPP TEST PHASE PLAN



The CHAIRMAN. Thank you very much, Admiral.

Admiral, originally, they had planned a test storage of high-level waste in WIPP. That is no longer part of the DOE plan, am I correct?

Secretary WATKINS. That is correct, it is not.

The CHAIRMAN. Now would you explain the difference between the high-level waste and transuranic waste in terms of hazard?

Secretary WATKINS. Let me put my expert on that, Mr. Chairman.

The CHAIRMAN. Mr. Duffy.

Mr. DUFFY. From the hazard standpoint, the transuranic waste is particulates that have been accumulated during production and manufacturing operations.

The high-level waste is the fuel or the processed end product from fuel reprocessing. The high-level waste is, from a curie standpoint, exceptionally higher than the transuranic waste. So if you looked at it from a curie standpoint, you would say that the hazard was greater with high-level waste than with transuranic waste.

Transuranic waste is an alpha emitter, and the problem comes from internal breathing and the potential for latent cancer associated with breathing. So from a hazard standpoint, I would put the high-level waste in a much higher radiation zone, a higher curie content, and probably from an exposure standpoint, a higher hazard.

From the internal ingestion—you cannot reduce any hazard from the standpoint of radiation. It is a hazard, and we have to recognize it is a hazard. And that is why we have done all the changes to the shipping containers, the handling operations, the safety aspects, that the Secretary identified, to make sure that we do not treat the transuranic any less because it is a lower hazard than high-level waste.

The CHAIRMAN. In plain terms, the transuranic waste does not have the kind of radiation that reaches out and gets you, shall we say, you have to pretty well ingest it?

Mr. DUFFY. That is right. We have two types of transuranic waste. One, which we call contact handle waste, which has a contact dose rate on the outside of the container of no more 200 MR, and that is on a 55-gallon drum.

The CHAIRMAN. MR being?

Mr. DUFFY. A millirem.

And the contact-handle waste comes in 55-gallon drums and is handled with forklift trucks and standard tractors for packaging.

The remote-handled waste can have as much as 100 millirem, and that is about 1 percent of the total waste. And that is handled remotely. We have remote-design machines that put it into a different configuration than the contact-handle waste.

The CHAIRMAN. Admiral, I want you to know that I stand in awe in respect and admiration of my two colleagues from New Mexico for what they do for that state. They cannot even get somebody to run against Domenici.

Senator DOMENICI. I have two opponents. [Laughter.]

The CHAIRMAN. I saw a list the other day of what states get per capita. And New Mexico gets more federal dollars per capita than any other state. And I help them do a lot of this on the Appropriations Committee.

Senator **Bingaman**. We do more for it than any other state.

The **Chairman**. They cry more, that is true. [Laughter.]

Senator **Domenici**. That is not true, you know. We have all of these important things we are doing for the country. The country is just doing what is right. It is paying for all of these good things we do.

Secretary **Lujan**. Mr. Chairman, may I jump in and protect my two colleagues? [Laughter.]

Senator **Domenici**. There is no charity involved, Mr. Chairman.

The **Chairman**. It is continuing the great Lujan tradition. [Laughter.]

But I see this agreement here between someone at DOE and the State of New Mexico, which I know they were behind, where they have now gotten DOE to say that they are for these emergency roads, or whatever you call them. And my guess is that sooner or later they are going to get some federal help on those. And I guess that federal help will proceed from that agreement.

My question is, however, and my concern is that these agreements about these roads might give somebody the impression that this stuff is really too dangerous to transport on ordinary roads. That the containers are not safe, and therefore you have to go with some auxiliary road.

My first question is, do you have containers that are safe, and tell me why you know they are safe?

Secretary **Watkins**. The TRUPACT containers have been proven safe and licensed by the Nuclear Regulatory Commission. They had to go through extensive testing, drop tests, burn tests, all sorts of——

The **Chairman**. They drop them from helicopters?

Secretary **Watkins**. They dropped them from a 30-foot height onto spikes, that sort of thing. It has been through every conceivable kind of tests. There are many that have said it is over-designed, why did you spend that money? That kind of thing.

Here is the picture of the flames that it was put in. Superman cannot get into this container. So that is the kind of thing we had to do, and I think it is proper to do that. I think transuranics are very unique. They have the actinides in there that are long-term problems for us.

And so it is legitimate to have all of this, and I think it can allay the fears of those people that see the TRUPACT trucks coming through, if they could just see these devices, see how the trucks are designed, see the command and control network, and recognize that there is no way a terrorist or other group can break into this particular device.

So we think we have probably the safest transportation device that we have ever designed.

The **Chairman**. Suppose you shot it with a gun?

Secretary **Watkins**. No, sir, it would not penetrate.

The **Chairman**. With a cannon? Would a cannon penetrate?

Mr. **Duffy**. It depends on the size of the cannon and the accuracy of those shooting it.

Secretary **Watkins**. We would get the cannon shooter before they would get it. We have a network here that is linked up with everybody, states, FBI and so forth, through satellite communications. We have the very finest moving device known to mankind here.

They go on the state highways, and there is no reason why a state highway is not fully qualified to take these trucks. I think the issue comes on bypasses and perceptions and concerns within cities that see this thing going by, that we have got to allay their fears.

And so I am not down on the fact that there may have to be some highway funds. As I said, about $100 million so far have been allocated, some already spent, and more to be spent.

The **Chairman**. I want to deal with the hazards. Suppose this break-proof container comes through town and gets stopped at a red light and some fool with a can opener comes out and opens it up and there you have the contents exposed. What happens to the people around?

Secretary **Watkins**. Well, I think that what-if is so unlikely, Mr. Chairman. We have a caravan that goes with this truck. This is not just a truck driver off the street. This is a highly-qualified, talented, anti-terrorist group that moves right together. Nobody is going to come open this thing.

The **Chairman**. I understand that the can opener will not open it. But let us say it does. Then what happens to the people? In other words, do you need this special route around the city?

Secretary **Watkins**. If, for example, the drums were to fall onto the street that are in the TRUPACT, which would be very difficult to do. But let us say they would fall onto the street. The external radiation dose, as mentioned by Mr. Duffy, is on the order—if you put your hand and stay right on top of the barrel, is a couple of hundred millirem per hour. At that rate, you would absorb, if you stayed there for 24 hours, you would probably get up close to the annual limit set by the Nuclear Regulatory Commission.

But I cannot see anybody hugging a barrel for 24 hours under these circumstances.

So there is not any heavy external radiation around these barrels. That is the difference between the transuranic.

The **Chairman**. Now it would not flow out of the containers? It is not liquid?

Mr. **Duffy**. No, no liquid.

Secretary **Watkins**. No, sir, it is not liquid.

The **Chairman**. In other words, if it opens, it does not blow up?

Secretary **Watkins**. No, sir, it does not blow up.

The **Chairman**. All right.

What you are telling me is, if this break-proof container breaks open, that nothing happens?

Secretary **Watkins**. Nothing happens if the drum does not break open.

The **Chairman**. That is what I am saying, if the drum breaks open.

Secretary **Watkins**. Nothing will happen except if you go and eat the material. Then, yes, it could. I mean you have got an alpha emitter there, and it is very serious, and it could be ingested. But when we tested this, when we dropped it from the 30-foot platform onto the spikes, we have the drums inside. They are not going to break.

The **Chairman**. Well, I understand they are not going to break, they cannot break, it is impossible to break, Superman cannot get in them. But if Superman does get in them, then nothing happens even then, is that right?

Secretary **Watkins**. Well, unless you eat it, no, sir.

Mr. **Duffy**. And breath it.

Secretary **Watkins**. Or breath it. Obviously, any way you can ingest the alpha emitter.

The **Chairman**. I am not saying it is not a good idea. I suppose dust or something could be a problem here.

Mr. **Duffy**. You have a 55-gallon drum. Inside the 55-gallon drum is a 90 mil polyethylene-liner. That is sealed. So you drop the drum, and you are exposed if the lid comes off to the polyethylene drum. If, then, the polyethylene drum is breached with your can opener or somebody comes with the Texas chainsaw and cuts it open deliberately, there are polyethylene bags inside. The polyethylene bags have to be cut, and then somebody has to get up close to it and breath in the material.

If they set it on fire, that is another problem. Then we would have airborne activity. And we have done calculations on that, in all our transportation studies, on what would happen if that was set on fire and people breathed the material.

But it is a deliberate, multiple, multiple, multiple event that would have to take place.

The **Chairman**. I guess the conclusion to this is that this agreement that has been entered into—and an agreement is an agreement—was entered into to protect against political hazards and not against safety hazards.

Secretary **Watkins**. I think in all candor that the Nation is getting much more aware of these issues and would like to make sure that we have done a good job in moving these wastes across country. Remember, we have moved these in barrels and in boxcars for years. For many years they have moved out to Idaho and so forth.

So, frankly, this is a major step forward in safety and transportation, something we have never really done before. So we are learning a lot in the process of making sure people feel comfortable, as comfortable as you can be with radioactive material moving on a highway. I think it is responsible for us to do this.

The **Chairman**. Do what?

Secretary **Watkins**. With modern technology to create the kind of transportation devices and systems that we have done here.

The **Chairman**. I am talking about the roads, now. What I am asking is are the roads necessary for safety, or was that agreement entered into for other purposes, political purposes?

Secretary **Watkins**. I do not know the background, Mr. Chairman, on the $43 million. I do believe that there are many legitimate concerns in the roadwork for the dollars that have already been expended, and it was my briefing when I came into the Department that the $43 million was a legitimate amount of money to complete all of the concerns around the road and if there is more needed in accordance with the agreement that Senator Domenici mentioned today that was made with the Albuquerque office out there which I was made aware of about a year ago, an agreement to do everything possible to support additional road building if that is necessary to open WIPP.

So I am not against that if that can be shown to be an essential need for safety as you bring it up. My problem is——

The CHAIRMAN. Is it an essential need for safety?

Secretary WATKINS. No, sir, we do not think it is. I think that is the point in debate.

The CHAIRMAN. If you agreed to it, you might have to do it. I am not trying to take dollars away from Bingaman and Domenici because they have an agreement, but what I am getting at is why the agreement? Was it for safety, or was it to get WIPP open?

I think I am hearing it was to get WIPP open, and I can understand that.

Secretary WATKINS. I have no more information here. I will do some research on the history and try to come up with where those dollars have been spent and where perhaps this $43 million will be spent in specific terms.

The CHAIRMAN. The agreement I read was $190 million.

Secretary WATKINS. That was an agreement, as I understand it, made at the time by the director of the office at Albuquerque with the State officials to do what he could to support road dollars up to that amount if that is necessary to open WIPP.

So if that understanding is correct, then obviously I would support the Department of Transportation and OMB if that is necessary to get WIPP open and if everybody believes that is the best interest. I do believe at this point in time, however, that I was given a $43 million situation when I took over this Department, and that is the commitment I have, to stay with that. That has been appropriated. It has been held up by the Armed Services Committee because they felt that it should not be utilized until such time as we had land withdrawal legislation.

I am trying to honor both sides. I have to report to two chairmen.

The CHAIRMAN. I understand that. I was just really inquiring about the safety proposal.

Senator DOMENICI. Mr. Chairman, would you to permit me to clarify something?

The CHAIRMAN. Sure.

Senator DOMENICI. Let me just say for the record I do not think it is fair for the Secretary to categorize the last agreement between the State of New Mexico and the Department of Energy as something that was just rather casually entered into by the then Albuquerque Operations Office director. As a matter of fact, we were there. Every member of the New Mexico delegation was there and the governor was there. The agreement was negotiated for weeks, Mr. Secretary, with your predecessor, the then Secretary of Energy.

The Secretary of Energy did not fly to Albuquerque to sign it, but I do not think the record ought to indicate that the agreement is some sort of a casual undertaking of no significance. It was entered into on behalf of the Secretary by the then Albuquerque field operations manager.

Secretary WATKINS. I think you are absolutely right, Senator. I am not saying it was casually entered into. I am merely saying that it was an agreement to support where necessary but not provide the funds from DOE.

My only concern in all of this is that I do not see how DOE can get into the road business continually. I do believe the first $43 million is a perfectly legitimate gesture that was passed on to me, and I have stayed with that commitment. After that, I will support whatever the Congress feels is necessary to get WIPP open, but I do not feel it should come out of DOE funds.

I have had all sorts of Members up here on the Hill from the Armed Services Committee saying if that money goes into roads down there we want Colorado repaved and we want Idaho repaved.

So those are the kind of issues that I think are beyond the scope of my text right now. We are barely hanging in there with waste management now, and I do not see that as a legitimate role for DOE, although I would support it. If the Congress says this is necessary to open WIPP, obviously you are going to get my support.

The CHAIRMAN. Admiral, in your testimony you state that you have done your best to insulate decisions relating to the opening of WIPP from the nuclear materials production cycle. Is there any scenario under which the failure to open WIPP actually causes a slowdown or a halt in the production of nuclear weapons? Should this concern us?

In other words, do you see that failure to open WIPP under any scenario you have could actually shut those plants down?

Secretary WATKINS. I do in this context, Mr. Chairman. I believe the opening of WIPP is essential for all aspects of nuclear waste management for the future of this Nation. Whether it is high level waste that would go to the repository if it proves out at Yucca Mountain or whether it is transuranics in this area or any other kind of waste, I believe if we cannot demonstrate that we can manage the technology necessary to dispose of these wastes it will be a tragedy for the Nation. I do believe it is that serious.

If we cannot show that we can get on to the test phase of this with all of the outside agencies that have talked to us and with all the engineering and all the science that has been dedicated to this, then we do not deserve to open WIPP, and we just have to live with the waste we have where we have it, because I do not believe the public is going to stand for it.

So I think it is that important to get this place open for test purposes to prove whether or not we can have a repository in this Nation. It will help in the Yucca Mountain, a flap that is going on now, and it will help in the low level radioactive waste issues because they are all somewhat coupled together. The curie level and the amount of activity is a little different. You handle them differently, but basically it is all the same issue.

So my guess is yes, it is. That is a political judgment that you are probably more equipped to handle than I more than it is a technical judgment.

The CHAIRMAN. I want to commend you, Admiral, for what you have done to restore a lot of credibility to the Department of Energy. It is a very, very difficult problem you have, and you knew it was a huge problem when you started. It is not all solved yet, but you have made tremendous progress, and I think you have gotten the admiration of everybody in the country for the efforts which you have put forth.

I hope, I think and I predict that we will successfully open WIPP and safely so, and I hope that we can assure the people of New Mexico and the country that it is being done with the utmost of safety.

So I want to thank you, and I want to thank Secretary Lujan for your testimony.

Senator Domenici.

Senator **Domenici**. Thank you, Mr. Chairman.

Let me first inquire of Secretary Lujan of just one moment. I may have missed something in your oral statement. I have your written statement. It, too, is a rather brief statement. I assume you did not read it in its entirety; is that correct, Mr. Secretary?

Secretary **Lujan**. That is correct.

Senator **Domenici**. Mr. Secretary, then, with reference to an administrative land withdrawal it seems to me there is general concurrence, if I read the Secretary of Energy right and if I read you right, that it is not a very desirable way to resolve the issue of land ownership of this site for WIPP.

I think you said in your written statement on page 3, and I quote, "Also, administrative land withdrawals do not address the health and safety concerns that have been raised in conjunction with this project."

Now I gather that that is your opinion, and if you are asked or directed to do this, to use your words, the withdrawal will not take care of the health and safety concerns. Is that correct?

Secretary **Lujan**. That is correct. I do not think that we should move ahead with administrative withdrawal, although I do not rule that out for certain purposes because, as we have it now, there cannot be any experiments carried on or anything like that.

Both Secretary Watkins and I insist that the best way to proceed is to do it by legislative withdrawal. I do not believe that I have the authority to make a permanent withdrawal, either. If we do not have a permanent withdrawal, then WIPP must be ready at all times to be returned back to the way it was before, sort of a reclamation effort, if you will. I do not know to what extent, but certainly that is implicit in the authority that I have, that it be ready to come back to Interior.

Senator **Domenici**. Thank you, Mr. Secretary.

Secretary Watkins, may I take just two minutes on the roadway money and the previous agreements so I can understand thoroughly your position. Then I would like to ask you some questions as to why it is urgent to get a land withdrawal bill. I frankly believe it is not urgent. You seem to think it is.

Have you seen the last agreement entered into in 1987 which starts with language saying transportation routes are needed to provide relief routes around congested urban areas and away from frequently traveled existing routes?

Secretary **Watkins**. Yes, sir. I have it in front of me now.

Senator **Domenici**. I gather that you also have seen the language in it that says the DOE will make a good faith effort immediately to join and support the state and its delegation in seeking special appropriations from Congress, and then there is a dollar number.

Do you see that?

Secretary WATKINS. Yes, sir, I do.

Senator DOMENICI. I take it that you do not feel that you are bound by that and you are not even asking us to live up to this agreement with the State of New Mexico as the Secretary of Energy. Is that a fair statement?

Secretary WATKINS. I was led to believe when I came to the Department that a good faith effort was represented by the $43 million that very hard won that we had appropriated last year but disallowed in language, at least disallowed in the sense that we felt obligated to comply with language from the Armed Services Committees, and I felt that after that I would be supporting whatever numbers that the Congress felt were essential to get the WIPP legislation and the land withdrawal through in negotiations, and I would certainly support that if that is justified.

I have no detailed knowledge of the safety ramifications of the $190 million against the various bypasses and relief routes that are explained in that agreement.

Senator DOMENICI. Mr. Secretary, you know without my stating it that I have the highest regard for you, and I really think your major asset, of which you have many, is your credibility. You have tried very hard to maintain it.

I strongly suggest to you that what you are saying here, the language you are using and the explanation you are using, is not credible. It is just not credible. The Department of Energy told a state unequivocally two things: First, the DOE will use its good faith efforts to support; and second, a dollar amount.

Now I am not going to spend the whole hearing on this because we have to talk about some technical issues, but I cannot believe that, with all you know and with this agreement, the $43 million, which was conditionally withheld from to the State of New Mexico by the Armed Services Committee, is compliance with this agreement. That is a giant leap of faith and interpretation that, frankly, I cannot understand.

The history of the funding of the road systems has been explained to your people ad nauseam. The first $54 million, so no one will have any misunderstanding, was to widen roads. The Secretary of Energy, your predecessor, agreed to support them, and let me tell you, I do not want to put you in their position. They did not do one stitch of work to help us get that money.

Do you want to know where it came from? It did not come from DOE, it came out of the Department of Transportation, interestingly enough, in direct appropriations. What I thought you were concerned about was whether you were committing to take this money out of the Department of Energy. Now, if that is your position, that is not inconsistent.

Secretary WATKINS. That has been my position. That is what I said in testimony before the House Armed Services Committee, was that it was a question of DOE funding, the $190 million. It was not the fact that I would fail to support you in an effort to try to get additional dollars to get WIPP open, and I want to make that clear.

I am willing to help, but I cannot come over with a budget and get it approved by the Office of Management and Budget for $190 million on my land withdrawal proposal. It just will not sell. There are a lot of ramifications to that that get right into the middle of who is going to provide the offsets for this in a Gramm-Rudman-Hollings year. Already, the $43 million is down to $42.4 because of Gramm-Rudman-Hollings, so we have got real problems, Senator, in trying to find the source of those dollars at a very tough time.

Senator DOMENICI. I am probably am as aware of your dilemmas in that regard as anybody here on the Hill, in terms of your operational budget, the pressure of the environmental clean-up on the operational budget, the new things you want to do in the Department, and the pressure for the old mission. I am aware of all that.

Let me just ask a last question on the roads. If Senator Bingaman and I, in any land withdrawal bill that comes through here, if and when it does, are asking for compliance with this agreement without stating who pays the bill—if we only authorize the money, and then find out where we get it—is it fair to say that you will not have any objection to living up to this agreement by way of authorizing the expenditure of this money by the Congress?

Secretary WATKINS. I will certainly not oppose anything you do along those lines, if that is necessary to open WIPP, Senator Domenici.

Senator DOMENICI. Thank you, Mr. Secretary. Mr. Secretary, somewhere in your statement you say the pressure is off because you have disassociated Rocky Flats and its problems from the opening of WIPP—I am paraphrasing. They are two distinct projects, and you are not moving with WIPP because Rocky Flats is creating a current urgent problem. You are solving Rocky Flats, and now you want to solve the problems with WIPP separately?

Secretary WATKINS. I think the context in which I made the statement, Senator Domenici, still applies, that with the waste minimization and with the compactor anticipated to start operating this fall, that we have an 18-month period of time when we can work these problems with the States in a much more orderly fashion than some sort of abrupt discontinuity on the 1st March, 1990, which we anticipated late last year, but because of other actions that we took we were able to avoid that.

Now, that gives us time to perhaps get WIPP into its test phase. That is very important to the other governors. They all are holding me hostage to WIPP getting open, so it is not just a New Mexico issue, it is an issue as was stated by some of the members here in the Committee today as being much broader than that. It goes into Idaho, into Colorado, into the other States, and Hanford, Tennessee, South Carolina and Ohio.

So we have a very important step that once it is underway, people will begin to see light at the end of the tunnel and maybe then we can make some other kinds of arrangements for Ft. St. Vrain fuels, perhaps some future moves, perhaps some adjustments on the self-imposed levels in Colorado, because everyone wants to keep my feet to the fire, which I fully understand and I congratulate them for doing this, because I think it has forced this thing to a head, and I believe that opening of WIPP will begin to move the flow and stop the constipation in radioactive waste in the country that we have been witnessing now for too many years.

Senator **Domenici**. Mr. Secretary, one last question, and then if the Chairman thinks we have time I will come back after Senator Bingaman and others have had a chance, and ask some additional questions.

Let me just ask you, Mr. Secretary, has not the pressure from governors like the Governor of Idaho, which was built around, at its inception, getting WIPP open as quickly as possible, has it not put the pressure on you and the Department of Energy to get on with your game plan and solve in an orderly manner the myriad of scientific and technical problems that were not being solved?

Secretary **Watkins**. No question about it. Senator Domenici, you knew more about this by an order of magnitude than I did on coming in here a year ago, and everything you have told me during my confirmation preparations was exactly on the mark. I had to learn a lot of that myself and I finally came to grips with it by June 1989. It took me several months to really get my arms around it.

So that pressure has been very important. Governor Andrus, Governor Gardner, Governor Romer, Governor Carruthers of New Mexico, Governor Campbell, we have worked very hard with all of them on this issue and they have been very firm that unless we can demonstrate that we can get on with managing this program and stop all the technical and other confusion, that they were not going to play in the game, and I agreed with them on that.

Senator **Domenici**. But Mr. Secretary, why should we deceive anyone, including those governors? Even if one or more of them has equated a land withdrawal bill with the opening of WIPP, why should we not keep the pressure on to get everything done rather than pass a land withdrawal bill before everything is done? I mean, I frankly cannot, with the list that is very long—your list, not my list—of things that still have to be done, I cannot understand how we gain anything for anyone by passing a land withdrawal bill with 15 conditions in it, if we could pass a land withdrawal bill with none or one. It seems to me the pressure of the land withdrawal bill, because it has taken on this big life of its own, is salutary. It may be if you pass it, the pressure would be off and things would drag and administrative decisions would have to be made, maybe by those outside of your Department.

Secretary **Watkins**. It will take no pressure off, Senator Domenici. Let me say, it is so important to move WIPP along at the proper pace that by June of this year. I do not expect to have any outstanding items left on our check-off list except the final action by EPA on the no migration petition. That is why I have set June as a date.

This means, then, if we can wrap that up by 1 October, 1990, all prerequisites to moving waste in there for test purposes have been met, it just seems to me that it is appropriate for us to recommend, with the caveats we have of those things that are yet to be done, to come here and start the process now in the Congress, which certainly will take, with all the things on your agenda, until 1 October of 1990.

So it is not as though you could do it overnight, and the worst thing we can do is get down there, have all the technical things ready and then sit six months to wait for land withdrawal legislation while the Congress is adjourned for elections and we have to come back next year again and start the process over again.

So I do not believe we are trying to rush it. I think we are trying to move in parallel so at least we have the option, and you can hold it up here until the last minute. If you want to hold it up until the day you leave that is fine with me, but it has to be this session or we are going to put ourselves in another six months position where all the fear and apprehension is going to be raised again by all the other governors of are we serious about moving it, if in fact we have done all our technical job correctly.

Senator DOMENICI. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Bingaman?

Senator BINGAMAN. Thank you, Mr. Chairman. Let me start and again compliment Secretary Watkins for the way he has tried to move forward on this. I think he has acted responsibly. That does not take away from the fact that I think there are still some things to be done.

The sticking points on this legislation in previous Congresses, when we were working on it in the last Congress, was the question of whether or not waste needed to go to the site to do experiments before the site met EPA standards and that was the real issue, and if waste needed to go to the site, how much?

I understand that you had advice from the National Academy of Sciences and various groups that they would agree that a certain amount, up to one-half of 1 percent, could be justified to go to the site to accomplish experiments on gas generation. I believe those were the only experiments they have identified so far that need to be done.

I guess my question is, there are also people around who say yes, it would make some sense to take waste to the site to do those gas generation experiments, but they could be done away from the site. And since they are going to take three, four, or five years to accomplish, you ought to go ahead and get on with doing those gas generation experiments at another location.

If that is an option available to you, why do you not take that option so that your ability to go forward and to get the results of these tests is not dependent on what Congress does?

Secretary WATKINS. I am going to have to turn to Mr. Duffy for some technical answers to that, Senator Bingaman.

Mr. DUFFY. I think the issue has been discussed now for the last three to four years on whether you should do parallel tests, whether you should do tests outside of WIPP or whether you should do tests in WIPP. I think we have spent $800 million to provide a test platform for testing in WIPP, and I think everybody that has looked at the test plan has definitely identified that the desirable aspect is to get on with testing in WIPP.

There are sections of the test program for bins which are identified with regard to saturated brine with plutonium in it, for identification of plutonium leachate into the brine system that could be done above-ground. We are looking at that and we have had discussions with the EEG, we have had discussions with the National

Academy, we have had discussions with the blue ribbon panel, on whether that portion would be done outside of WIPP.

That is on the order of 50 to 100 drums max, and looking at the one-half of 1 percent, we are talking about 4,500 drums in the waste environment including the steel for the alcoves, which is very important to demonstrate that we can work in the environment of WIPP.

So there is a controversy. There is always a controversy in technical areas, but I think the majority of people identify that we should go on with the testing in WIPP.

Senator **BINGAMAN**. Well, just to push it one step further. The one-half of 1 percent that the Academy of Sciences and others have said could be justified, the experiments that are contemplated with that one-half of 1 percent, is there a reason that they could not be accomplished away from the site? I mean, I understand your preference would be to do it at the site, but is there a reason that that could not be accomplished?

Mr. **DUFFY**. We are doing parallel laboratory tests so that we can confirm the tests that are being done within WIPP. It always comes down to, if you do a laboratory test then the argument comes, is that going to be the same environment that is in the Waste Isolation Pilot Plant, and the argument then comes back well, have you done it in the Waste Isolation Pilot Plant to confirm it?

We are doing it in parallel. From the corrosion standpoint facilities necessary to identify the operation of putting the 4,500 drums in salt, it cannot be done outside the WIPP. It cannot be done in a laboratory.

Senator **BINGAMAN**. That is not the one-half of 1 percent.

Mr. **DUFFY**. That is the one-half of 1 percent. The one-half of 1 percent includes the alcove tests. It is bins and alcoves. The bin test is about 600 drums, out of the 4,500 drums. In the EPA comments concerning two full rooms, that would get us up to about 15,000 drums, and that still has to be reviewed with the EPA.

The National Academy of Science identified that we should not proceed with anything further as far as greater than one-half of 1 percent, until we have demonstrated that we have the scientific portion under control and that future testing will not interfere with our scientific data. But they have identified—the blue ribbon panel has identified that we should be working on putting the one-half of 1 percent in early so that we have a long-term program.

We are going to have to guarantee the operation of this site for 10,000 years after the 25,000 years of operation, and the scientific program, the sooner we start the more information we have. Again, most of the people that have reviewed it say you cannot prejudge scientific data, so do not try to force an answer on scientific data because of a schedule. What we are trying to do is develop a scientific program that will give us laboratory test data and WIPP test data.

Senator **BINGAMAN**. The testimony we have had here refers to this two percent that EPA suggested to you instead of the 0.5 percent.

Mr. **DUFFY**. They suggested an initial two rooms, which would represent about 1.5 percent.

Senator BINGAMAN. Am I correct that all of the independent scientific panels that have looked at this—the National Academy of Sciences, the Environmental Evaluation Group, Blue Ribbon Panel—all of these folks, none of them have endorsed the need for 2 percent; they have all stopped with 0.5 percent?

Mr. DUFFY. They have made a final conclusion on that. In fact, there is a mixture, as in any group. I think in the Blue Ribbon Panel three out of the five members identified a need for additional testing. The key thing was not to interfere with the 0.5 percent test.

Senator BINGAMAN. I did not think you had even asked them about this two percent. This came up later in an letter from EPA to you.

Mr. DUFFY. We identified previously up to 2.8 percent, which included an operational demonstration. At that time, the operational demonstration should not be conducted in interference with the 0.5.

Senator BINGAMAN. We have got three types of tests here. We have got the tests that are needed, the gas generation tests for the 0.5. Then we have got what EPA suggested, which is another 1.5. Then we have got the operational tests.

Now none of these technical groups have looked at that 1.5 additional that EPA has asked for; is that correct?

Mr. DUFFY. The no-migration petition identifies that in order to do the 1.5 percent test we will have to go back to the Environmental Protection Agency with the plan, and we will have an external review of that testing operation prior to going back to the Environmental Protection Agency with that. We may have to submit a no-migration variance petition amendment at that time, if it comes out.

Senator BINGAMAN. That was not my question. I guess my question was: We had or you had all of these groups—this blue ribbon panel, the National Academy of Sciences, EEG. All of them looked at the question of whether you needed to do the 0.5 percent. And they concluded yes, that made some sense. They have not made the same analysis with regard to the extra 1.5 that EPA has asked for.

Mr. DUFFY. At the review of the plan for the 2.8 percent and the review of the operations, that is when we got the comment back from the Environmental Protection Agency, and we do have a plan to go back to those other groups for review.

Senator BINGAMAN. So you are going to ask them about the 1.5 percent?

Mr. DUFFY. Oh, yes. We will have an outside peer review group.

Senator BINGAMAN. When will that happen? Before we consider whether to legislate in this area or what figure to put in there, I guess just as it was useful to have their input on the 0.5 it would be useful to have their input on the 1.5 additional, instead of just sort of taking on faith that EPA knows what they are talking about when they say why don't you do another 1.5.

Mr. DUFFY. We are preparing the test alternatives at the present time, which identify the types of waste that will be considered to go into WIPP and which would go into those rooms.

The question in EPA was an internal question on whether or not we should submit the material to crush operation over a 10-year period or whether we should have a fully-retrievable non-crushed drum, and we will have to resolve that with the EPA. Then we will write the test plan. It will be in the next 6-month period when we identify that.

Senator BINGAMAN. So it will be another six months before you would have an assessment from these other groups about the additional 1.5?

Mr. DUFFY. Yes, sir. And we would not put that material in for at least another year to year and a half of operation.

Senator BINGAMAN. Let me ask you another line of questions. It seems to me there seem to be hurdle after hurdle here and you jump some of them and there are still others. The large hurdle that I see coming down the road—and maybe your testimony referred to this, Admiral Watkins—is the question of whether this gas generation, which is turning out to be much more than people had expected, will require engineered modifications of the waste.

If that occurs, then we are back to a whole new plan B, which says, okay, we have got to vitrify this stuff or we have got to cement it or we have got to incinerate it or we have got to shred it. We have got to do something with it before we put it in there.

Now you indicated, Admiral Watkins, in your testimony that you have an accelerated effort under way to identify and test potential engineered modifications to the existing waste forms. I guess I would like to know when you are going to know that. I think your plan here, the one that is laid out, says something about——

Mr. DUFFY. This diagram right here identifies the test program and engineering alternatives data analysis between the time period 1991 and 1992, with the final solutions for some of the programs in the 1993 time frame. It is a phased operation. We have right now test recommendations for grinding and concrete, which is a very straightforward operation.

We already have waste that has been placed in concrete and stabilized, and we could put that material in when we have demonstrated we have retrievability. We will not have retrievability demonstration until 1992. We could vitrify. We could incinerate. We could chemically treat. And we have these identified as part of the test program.

We will probably, in our recommendation to EPA, have those as part of the room wastes for the test program for EPA.

Senator BINGAMAN. Well, I guess I am still not clear. When will you know whether you need to modify this waste before it can be put in?

Mr. DUFFY. When we identify whether or not the gas generation in the three to five-year period meets the requirements for no migration.

Senator BINGAMAN. So sometime three years to five years from now?

Mr. DUFFY. That is right.

Senator BINGAMAN. At which time you may decide you need to build an additional facility to accomplish vitrification?

Mr. DUFFY. No. We have not identified a vitrification facility. What we have identified is one of the operations could be vitrification. But the other is the straightforward grinding and concrete operation which we have capability to initiate. We would know what the time period is on that.

I think one of the key things you have to recognize, Senator, is that we are trying not to force the test program to make a decision on when to open WIPP, and that is the key thing. We are running the test program to demonstrate we meet the no-migration petition and we meet the requirements of 191, Part B.

Senator **BINGAMAN**. Let me just clarify one other thing with Secretary Lujan. The position of the Department of Interior is that you do not have authority to permanently withdraw this land.

Secretary **LUJAN**. Unless the attorneys tell me different, right now I believe that I do not have authority for a permanent withdrawal.

Senator **BINGAMAN**. So in order to go forward with any kind of assurance that the land would be usable for this purpose for the indefinite future legal action or a change in the law is required by the Congress?

Secretary **LUJAN**. It takes Congressional action. I cannot withdraw any amount of land over 5,000 acres except for 20 years. That is the longest that I can do it.

Now I can renew it.

Senator **BINGAMAN**. But you cannot provide any assurance that your successors would renew it?

Secretary **LUJAN**. No, I cannot, certainly. And I might add that then DOE would have to go through the additional expense, even if it proved to be a feasible thing to bury the waste, of always having it retrievable because then it would have to meet again the standards of Interior rather than the new standards.

Senator **BINGAMAN**. Each withdrawal would have to do that?

Secretary **LUJAN**. Well, any time they put anything in there, it would have to be retrievable, it would seem to me.

Senator **BINGAMAN**. So it could not become a permanent repository as long as it is under administrative withdrawal, which it is today?

Secretary **LUJAN**. I believe that is correct.

Senator **BINGAMAN**. So to make it a permanent repository we need to pass land withdrawal legislation, and that is your position and the Department of Energy's as well, as I understand it.

Secretary **LUJAN**. Yes. As a stopgap measure, let me tell you that we could have a temporary withdrawal, if we modify the present agreement. The present agreement does not allow for burying anything in there. So to conduct any experiments or anything like that we would have to modify the present agreement.

Senator **BINGAMAN**. The agreement between the Department of Energy and the Department of Interior?

Secretary **LUJAN**. That is correct.

Secretary **WATKINS**. I think also, Senator, you know, we talk about being sensitive to the needs of the citizens of New Mexico, and I believe that a legislative land withdrawal also gives us the opportunity to talk about the variety of business and payments equal to taxes and the other things that we know should be in there, that are a very legitimate need.

We certainly do not want roads to be the only thing we are concerned about. It is very important that were this repository not to prove itself and were the test phase to fail, we do not want to leave the local people in the Carlsbad area without some hope that they have not bought a pig in a poke.

So we need to be very sensitive to that. And this gives us the chance to work that with you up here on the Hill. So I think the land withdrawal is in the best interests of the people of New Mexico as well, the legislative land withdrawal. Let us work it, and you decide up here whether this road issue is an important issue for opening. If it is, I will support that.

So I think that is the beauty of getting going on the land withdrawal, even with all the caveats we have in there in our proposal coming to you that we must complete certain milestones. I think it will begin to allay some of the fears that we are trying to run roughshod over anybody on this issue by just talking about the sensitivities to New Mexican needs.

Secretary **LUJAN**. May I expand a little on that, Senator?

Senator **BINGAMAN**. You are going to have to quickly.

Secretary **LUJAN**. As you know, I was involved in the negotiations when I was in the Congress to get all of these additional provisions in there, and it concerns me that under the type of withdrawal that I would have to make we could not address those issues, just like the Secretary said.

Senator **BINGAMAN**. The Chairman has stepped out to vote, and I need to do the same because we have got just about six minutes left. If you would please just wait a few minutes in case the Chairman has some additional questions for you when he returns.

[A brief recess was taken.]

The **CHAIRMAN**. Admiral, what do you consider to be the biggest obstacle to opening WIPP for demonstration purposes?

Secretary **WATKINS**. I think the biggest obstacle from a technical standpoint is resolution of final comments on the no-migration petition. This has never been done in the country before by EPA or ourselves. It is a very complex issue to prove the no migration of this material for the length of the 10,000-year life of the repository.

So these things are very complex technically, and we will have extensive comments, I am sure.

The **CHAIRMAN**. That is not the water migration problem; it is the salt migration?

Mr. **DUFFY**. Hazardous waste migration through the facility and out to the boundary.

The **CHAIRMAN**. I mean, what is the problem there? The salt seals it off.

Mr. **DUFFY**. You have to demonstrate that it does not go out during that time period. It is a modeling operation. You have to know the characterization of the waste. EPA is looking at all the input data that we have, the types of waste that is going into it. It is not the radioactive portion; it is the hazardous portion, which represents less than one percent of the waste in there.

The **CHAIRMAN**. You say it is not the radioactive but the hazardous part?

Mr. **DUFFY**. Yes. In 1987 the Waste Isolation Pilot Plant came under the Resource Conservation and Recovery Act. Up until that time it was under the Atomic Energy Act. And at that time we had to demonstrate that the small fraction of material that could be considered hazardous material such as trichloroethylene, chloroform, lead, materials of that nature, would not migrate outside the boundary of the facility for 10,000 years, and that is what the no migration petition variance does, it looks at our submittal and then validates or asks us to do additional testing to validate.

The CHAIRMAN. That is under RCRA?

Mr. DUFFY. That is right.

The CHAIRMAN. Senator Wirth.

Senator WIRTH. Thank you very much, Mr. Chairman.

Thank you all for being here and your work on this terrible problem. Mr. Secretary, I have a brief question on storage. Are you confident that WIPP plus the compacting that is going on at Rocky Flats will be sufficient to take up Rocky Flats' waste?

Mr. WATKINS. No, sir, not completely confident, no. We are not pushing it in that direction. My feeling is that what we are doing now—and we are very open about it—is we are looking at perhaps some alternate temporary sites for surface storage. We have put out a request for a proposal from a variety of states. Over the next two and a half years we have to go through an EIS, we have to go through all the harangue on that, but that still has to be in our plans, in our WIPP start-up plan.

We have to look at alternatives in the event this does not pan out or that we are extending this test phase over a very lengthy period of time beyond, say, five years. So, definitely we are going to look at alternatives because in the fall of 1991, as we presently project, we are going to reach 1601 if, in fact, that stays a self-imposed limit.

Senator WIRTH. What kind of alternative storage do you think is going to be likely?

Mr. DUFFY. It would be a storage in a RCRA class building that would withstand up to any design basis requirements to meet a storage facility for hazardous and trans-uranic waste. It would be as simple as a concrete building.

Senator WIRTH. That would be on a military reservation?

Mr. DUFFY. No, sir. It could be on private land. Depends on whether we get a volunteer state or not.

Senator WIRTH. Let me jump now if I might to the reopening of Rocky Flats, Mr. Secretary.

Last fall when the operations at Rocky Flats were suspended and when you replaced Rockwell, you said that you would not be bound by any set dates, that you were only going to do what was safe and that you would submit to an independent review before operations were resumed. That is still your plan, I presume?

Secretary WATKINS. That is correct. We will actually have two independent reviews, one done by the Nuclear Facilities Safety Oversight Board set up by the Congress under Mr. Conway, and one under former Chairman of the Regulatory Commission Mr. Ahearne under the Advisory Committee on Nuclear Facilities Safety. Those act very independently of me. I do not give any specific guidance as to what they should report on and so forth.

Senator WIRTH. What is their schedule for this independent review?

Secretary WATKINS. I could provide that for the record. It is a very extensive schedule in and out. They are reviewing documents, they are going out there by individuals and sometimes as a group.

In fact, Mr. Ahearne was just out there and gave us another review on his concerns and so forth.

Senator WIRTH. When will these two independent reviews be completed?

Secretary WATKINS. Before we start.

Senator WIRTH. What is the date for that?

Secretary WATKINS. I cannot tell you the date because I am not ready to put out my start-up plan yet. They are going to want to stay in the game right up to the last minute.

Senator WIRTH. Will those independent reviews be open for public comment?

Secretary WATKINS. Open for public comment, for public consumption? Yes, sir. We plan a thorough communications plan for the community out there commencing relatively close to the date. I say all right, the first building at Rocky Flats of the seven that we have to address or six or seven will start up on such and such a date. We will give the rationale why we are saying that, what independent review has been given, what items remain in the hopper to complete by that time, and we are going to start a regular communication plan out there at the Rocky Flats site to make sure everybody is aware of where we are going, what independent reviewers are saying, and how we stand relative to the planned start-up date.

Senator WIRTH. We appreciate that. We so far have no schedule, though. What is your best guess?

Secretary WATKINS. I am not going to tell you, Senator Wirth, because I do not have the information now necessary to make that judgment. I am having the EG&G group in within the next couple of weeks, and we are going to have another skull session on their plan on problems that they have identified, on problems Mr. Conway's group has identified, Mr. Ahearne's group, and see if they are all covered in the start-up plans. So we are staying right in parallel with the independent oversight groups that are giving us their best input.

Senator WIRTH. I am a little confused at this point. If we do not know when the independent review is going to be completed and we are not going to resume operations at Rocky Flats until that independent review is completed and assures you that Rocky Flats can be reopened safely, if that is the case on the one hand, I am a little confused about your statement last week before the House Armed Services Committee that you planned to resume plutonium operations at Rocky Flats beginning in the second quarter of 1990.

Secretary WATKINS. That is our best estimate at this point in time, but we can start up in the second quarter, and I am still holding to that estimate.

Senator WIRTH. But you said you cannot give us any idea when the independent review is going to be done?

Secretary WATKINS. What we are doing now is listening to the independent review groups that are focusing on Rocky Flats very heavily. There are two different bodies, totally disconnected with each other, doing their own independent reviews. We are taking the recommendations and with EG&G and DOD experts are factoring them into the start-up plan.

If, in fact, some of those turn out to be longer pulls from the tent than we had planned, then a date within the second quarter is going to slip.

Senator **Wirth**. You just adamantly said to me when I asked you about some kind of timing on the independent review, you adamantly said to me that you could not give me a date on the independent review.

Secretary **Watkins**. I thought you were asking for a specific date. I cannot give you a specific date.

Senator **Wirth**. And I said give me your best guess as to what might be possible, and you adamantly refused and said we would not do that. But, on the other hand, you are saying to the Armed Services Committee in testimony that it looks to you like operations can resume in the second quarter of 1990.

Secretary **Watkins**. That is still valid. I thought you meant a specific date, Senator Wirth. I am sorry. I misunderstood.

Senator **Wirth**. Now, I am trying to understand this. If that means the operations at Rocky Flats are going to be resumed in the second quarter of 1990——

Secretary **Watkins**. The first building, our best schedule can start up beginning in the second quarter, beginning in the second quarter. That is all I have ever said.

Senator **Wirth**. What is the second quarter of 1990?

Secretary **Watkins**. It starts on the 1st of April and ends the end of June.

Senator **Wirth**. Now that means that sometime in the next three months it is your best guess that operations will resume at Rocky Flats?

Secretary **Watkins**. Operations in the first building will commence. That is not full operation of all buildings.

Senator **Wirth**. Let me see if I understand that, what the purpose of the independent review is. That means the independent review will be completed.

Secretary **Watkins**. If in fact we start up in the second quarter as presently planned, it is true that we will have all the independent review.

Senator **Wirth**. So, therefore, the independent review will be done. In order for it to start up, the independent review will have to be done by the end of the second quarter.

Secretary **Watkins**. If it starts up in the second quarter as planned, that is correct.

Senator **Wirth**. So, we must be pretty close to that now?

Secretary **Watkins**. I do not know that, Senator Wirth. I am going to really be scrubbing this thing very hard.

Senator **Wirth**. I hope so.

Secretary **Watkins**. I want to do what is right, and I think you want me to do what is right.

Senator **Wirth**. And you are. I am just saying that on the one hand we are saying that it looks as if we have a very targeted date for this, but on the other hand we have no date for the independent review, which I understand.

Secretary **Watkins**. The independent review, Senator Wirth, is going on as we speak here today. The two independent groups, looking at the data, reviewing it, visiting Rocky Flats. This is an ongoing effort. This does not just happen on a day. This is ongoing all the time, reviewing all the specifications.

Senator **Wirth**. But, for the record, we are not planning the resumption of operations at Rocky Flats until the independent review is completed?

Secretary **Watkins**. That is correct.

Senator **Wirth**. We have had a series of problems at Rocky Flats documented extensively by DOE's own investigations. The Tiger Team assessment, the assessment by Roger Mattson, the criticality safety and DOE's environmental surveys, technical safety analyses, and the Ahearne Committee, a whole series of analyses of Rocky Flats.

Now, the department has historically been very good at charts. We got another very good chart this morning on WIPP.

Would it be possible to have a chart that lists all of the problems that have been found by these various studies and then determines what corrective action you and EGG think ought to be taken and what the schedule is for repairs? We have flowing into this all of this information that is coming into Rocky Flats. Constituents, people who live in the Denver metropolitan area are looking at all of these different studies.

We are hearing that maybe operations are going to resume this quarter. We have all of these outside analyses of problems.

Now, would it be possible to put together a simple public chart that says these problems have been found, this is the corrective action that we are going to take, and that this is the schedule on which that corrective action can be taken.

Secretary **Watkins**. Of course, that is what we are doing, Senator Wirth. That is the name of the game.

We have what is called issue resolution that goes back to—about 15 years, all reports that have ever been submitted. This is what the Conway group must do. It is done in the nuclear industry all across the nation. So, we are looking at every single issue ever raised by any group, and all those have to be resolved before we start up, and that is part of our game.

And we will tell the people in these various sessions we will have when I finally announce the start-up of what we are doing out there, and it will include the issue resolution of all major issues like criticality issues and the like.

Senator **Wirth**. Let me ask the question.

The **Chairman**. Let me interrupt at this point. Do we have any further questions of Secretary Lujan? He is signalling that he would like to go.

Thank you very much Secretary Lujan.

Secretary **Lujan**. Thank you very much, Mr. Chairman.

Senator **Wirth**. Let me then, if I might, Secretary Watkins, ask the question again.

If, in fact, this is the process you go through, is there someplace that the public can review all of these analyses that have been done at Rocky Flats to go through and look at the problems that have been found, what remedial action you and EGG think ought to be taken and the timetable for that if you all are doing that anyway. Is it possible to put out so that people can see what is going on at Rocky Flats, what problems have been found, what you plan to do about it.

If you are doing this anyway, would that not be something that could be put into a chart that is at least as simple as this one?

Secretary WATKINS. I do not know, Senator Wirth. I would like to take a look and see if we can do more than we are doing today. We are going to come up and brief the Congress and you in some detail on the start-up plan and everything we have done.

In fact, it is your Nuclear Facilities Safety Oversight Board to bring up here and ask them to tell you what they have done to look at all issues and resolving those issues. That can be done in open session here, and I see no reason not to do that because they have to make all of their record available in the public readings rooms just as we do.

Senator WIRTH. What I will do then is I will just send you a letter putting this down quite specifically as to what it is. I think it would be helpful for people to have, to be able to see what all the problems are that have been identified by all these teams.

Let me give you an example as to why this is important, Mr. Secretary. The Tiger Team went thought Rocky Flats last July. Their assessment was supposed to be followed by an action plan which was to address their findings. We have not yet seen any kind of an action plan. This is last July, now, nine months ago. The Tiger Team went in there. Deep concern in the community. We have an enormous number of people going in, analysis going on. People think terrific, the Secretary is getting on top of this and the regime is getting on top of this.

One of the things that was said was that when that Tiger Team went in that their action plan would be coming right after, and it has not been seen yet. We have not seen, so far as I know, an action plan for the findings on the Tiger Team.

Now, this is one of many examples. People who are living downwind from Rocky Flats are again reminded of the fact that here is a plant with 62 pounds of plutonium in the ducts.

People saying it was fortunate that it was not a criticality incident. I mean, this is a significant situation downwind of one of the windiest areas in the country. You are familiar with this. You know that. But people out there are looking at this and they are saying well, what are the problems and what is going to be done about them, just to put them down on a schedule in sort of the King's English that people could follow. That is, I think, a reasonable request.

I will put this in a letter to you, Mr. Secretary, and try to again line out why this is important and why we are concerned about this to try to understand all of these pieces for public consumption.

Secretary WATKINS. We are putting all of these in a plan. That is called the EG&G startup plan which we have reviewed, will be modified again and again as we move down the path for initial building startup. We plan to brief the citizens on this and try to put it in language they will understand. We are not trying to hide anything.

Senator WIRTH. I understand.

Secretary WATKINS. We are wide open with the state. We are working with Governor Romer very closely. We are trying to resolve an issue that should have been resolved years ago by both oversight committees here in the Congress and the DOE and, before that, ERDA, and it was not done. I am trying to do this in a sensible way.

Senator WIRTH. Mr. Secretary, I understand that.

Secretary WATKINS. I think we have an excellent program, and I am willing to air it with anyone.

Senator WIRTH. I am not threatening you, Mr. Secretary.

Secretary WATKINS. We are talking volumes and volumes, Senator Wirth.

Senator WIRTH. I am not threatening you, Mr. Secretary. I am just asking you for a simple outline of what the problems are, what plans ought to be taken and what the timetable is.

Secretary WATKINS. It is a startup plan, Senator Wirth, and you have been briefed on it.

Senator WIRTH. If that is the case, then why can we not have that sort of thing publicly so that people can see it?

Secretary WATKINS. It is available in the public reading rooms. There is no problem. I can send up the startup plan right away.

Senator WIRTH. Fine, Mr. Secretary. Then we will see if we can get that simplified.

Let me ask you a final question. The Department requested $600 million for building 371, for "new building 371".

Secretary WATKINS. It is going to be somewhere between $500 and $600 million. We do not have our final total estimated cost yet.

Senator WIRTH. Yet, when the Department requested $600 million for that, the Department could not find enough money for the repair operation that is going on out there.

Your own modest cleanup plan had significant budget cuts. On the one hand we are asking for a new facility or a relatively new facility, effectively a new facility, building 371, $600 million, and yet not funding for your own cleanup plan.

Now it is difficult for my constituents and difficult for me to understand how we justify spending $600 million for a new facility and yet we cannot put money in the budget for cleanup at a time when a number of other things are going on.

One, the National Academy study of the weapons complex says that this new building is not necessary.

Second, your reprogramming request seeks a ~~lot of funding~~ for plutonium reprocessing at Savannah River and also says that there is some capacity at the TA-55 facility at Los Alamos. Yet, the justification for the $600 million is that there is an enormous rush to build PRNP.

Third, the 2010 report says that the Department would start relocating Rocky Flats in about 1995.

Now it is difficult for us to understand that, with 62 pounds of plutoniums found in the ducts out there, enough for a lot of nuclear weapons, the criticality problem that existed in the past, money is cut for cleanup at Rocky Flats and more money is put into building a new facility. The rationale for those do not seem to meet.

Can you explain to us the $600 million and then a cut in money for cleanup?

Secretary **Watkins**. Well, I will try to put it this way as best I can, Senator Wirth. I have done it in testimony before and letters up here on building 371. Building 371 is needed for cleanup. It is needed to phase out Rocky Flats in 20 years. There is no other alternative that we can see but to put it at Rocky Flats and do the job properly in separating out the trace materials that are left so we can finally close down Rocky Flats and this operation out there and find a spot elsewhere.

Building 371 will be in business for a long time. We cannot continue to expose those workers out there to the radiation levels in the old buildings for the closeout 20-year period. It simply is not fair to them. We are not using modern technology, and we do not know how to finish up the cleanup eventually and close it out so that it can be returned to the state in decent condition so it can be used for other purposes.

Building 371 is part of that plan. So unfortunately, it is the cheapest way to go for the long haul to close out Rocky Flats. All our analysis shows that, and we stand very strongly behind the fact that we need that facility in just about the way we have planned it.

I am sorry that it was poorly operated and poorly managed in the early days of the 1980s when it was first put in. We should have been in business by the mid 1990s in 371. It was very poorly managed just like everything else in the Department, and I cannot defend that.

On the other hand, I believe now we have our act together. We have the right people there to work this problem. We have specialists from Los Alamos, and it makes a lot of sense to get on with 371 for the good of the closeout of Rocky Flats for the long haul.

Senator **Wirth**. Mr. Chairman, I understand what the Secretary is saying. The question I think we have to look at is the design and the committed funding for 371, the $600 million, necessary only for cleanup, or are there going to be found possible cheaper cleanup-only options?

I understand your concern about the workers out there and the concern for their health, and we agree with that. We are also concerned about a cleanup function. It is difficult to explain, I think, to people living around the plant that what we are going to do for the purposes of parts of a cleanup operation is put $600 million in and have a very modest cleanup plan, in fact, a cut in funding for that.

Those just do not seem to fit together, and that is a problem that we continue to have in understanding the funding pattern by DOE.

Secretary **Watkins**. I do not seem to have that same concern expressed to me by the governor, Senator Wirth. We have a five-year plan. We have identified the dollars in that five-year plan for Rocky Flats. We are putting in over $100 million in the next couple of years there. We have not even identified the 1992 levels. It could be higher.

We are going to commit to that State agreement. We have a consent agreement with the State of Colorado, and we are going to comply with that agreement. So I do not really understand why we are confused about the amount of attention we are giving to cleanup of Rocky Flats. We are giving it as we are giving it to all the other states, and this is the first time it has ever been laid out in an organized fashion.

Senator WIRTH. The reason for the confusion is that you said you were going to spend a certain amount of money for cleanup at Rocky Flats, and even that modest plan was cut in funding in the most recent request.

Secretary WATKINS. Let me have Mr. Duffy, Senator, address it.

Mr. DUFFY. In fiscal year 1990 we originally identified about $70 million for Rocky Flats. We moved up $20 million from the 1991 money to $90 million. In fiscal year 1991 we identified an $88 million budget. We increased that to $107 million. We are reviewing now the budget coming in for 1991, the request for the new contractor in there, and what we want to assure ourselves of is that we are not putting money into a budget that is not fully planned, and that is the thing we are doing right now.

We met with EG&G operations and will continue to meet with them until we get a resolution of the budget.

The CHAIRMAN. Senator Wirth, I hate to call time on this, but we have three more witnesses this morning.

Senator WIRTH. I understand, Mr. Chairman. Thank you very much.

Just a final note. EG&G has also said that they believe that significantly more money is necessary than you all have suggested for the purpose.

Thank you very much, Mr. Chairman.

[The information follows:]

**The Secretary of Energy**
Washington, DC 20585

May 1, 1990

The Honorable Timothy E. Wirth
United States Senate
Washington, D.C. 20510

Dear Senator Wirth:

Thank you for your recent letter in which you expressed concern regarding fiscal year 1991 funding for environmental restoration and waste management activities at the Rocky Flats Plant (RFP) and the continued operation of Building 371. You also requested that the Department of Energy (DOE) prepare a document to assist you in understanding our plans for continued operation of this facility.

I understand your concern over the apparent decrease in funding for environmental restoration, corrective activities, and waste management operations at the Rocky Flats Plant. As you stated in your letter, Congress appropriated $140 million for these activities in FY 1990. This substantial increase above the President's budget request was principally to fund commitments contained in the Agreement-in-Principle signed last June. The President's FY 1991 budget request is greater than his initial FY 1990 budget amount. Final funding determinations for proposed FY 1991 activities will be made after completion of the first annual update of my Environmental Restoration and Waste Management Five-Year Plan, scheduled for late May.

With respect to Building 371, the National Academy of Sciences proposed an alternative to the modernizing of Building 371 because they incorrectly assert that equivalent processing capacity and capability existed or could be activated at the Los Alamos National Laboratory and at the Savannah River Site. Building 371 is essential for continued operation of the weapons production complex. Improvements in safety for workers will be achieved during operation and during decommissioning of other RFP facilities. The primary purpose of the proposed construction of Building 371 is to provide uninterrupted capability for plutonium recycle and, thus, weapons component fabrication in a safe, secure, and environmentally acceptable manner.

Building 371 will also be provided with the capability to process residues stored at RFP which will assist in decommissioning RFP facilities when they inevitably reach the end of their functional life. The modernization study, now being prepared, will provide further insight into the DOE's plans for the long term modernization of the entire weapons production complex.

My staff is evaluating the schedule for resumption of operations at the RFP that has been proposed by EG&G. DOE's assessment of the schedule will be provided to the Defense Nuclear Facilities Safety Board (DNFSB) and to the Advisory Committee on Nuclear Facility Safety (ACNFS). Both the DNFSB and the ACNFS are independently reviewing DOE's resumption activities and will continue to do so. I will receive and consider any comments or recommendations they consider appropriate before operations are resumed. In addition, I am tasking Scientech, Inc., to review the action plan prepared in response to the Criticality Safety Assessment performed in October 1989.

You also requested that we prepare a public document containing information about problems at the RFP. The Department will release reports such as those that you mentioned and their associated corrective action plans shortly after DOE review and approval. To date, "tiger team" and Technical Safety Appraisal reports have been released and are available in public reading rooms under the supervision of the Rocky Flats Office.

Finally, to address a question you posed during my April 3, 1990, appearance before the Senate Committee on Energy and Natural Resources, I expect the Department to conduct two public hearings and two media presentations prior to resumption of RFP operations. Moreover, we are completing a detailed public information plan that the Department will release after review by State officials.

Please feel free to contact me should you desire additional information.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

P.S. Enclosed is a copy of the most recent Ahearne letter to me which includes a list of the ACNFS public meetings, as well as recommendations on Rocky Flats issues, and a list of reports they have reviewed on Rocky Flats.

**Advisory Committee on Nuclear Facility Safety**
to the
United States Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

April 20, 1990

Honorable James D. Watkins
Secretary of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Admiral Watkins:

I am writing to provide you with a brief status report on the efforts of your Advisory Committee on Nuclear Facility Safety to review the developments at Rocky Flats and, in particular, the plan for resumption of Rocky Flats Plant (RFP) operations.

Since our report to you last November, the Committee received a briefing from EG&G on their plan for resumption of operations at open ACNFS meetings in Washington on December 11-12, 1989 and February 20-21, 1990. At the February meeting EG&G informed the Committee that they are not as far along as they thought they would be last December. We formed a Rocky Flats Subcommittee that has been meeting with DOE and EG&G management to develop the information base needed by the full Committee for assessing the readiness of EG&G to restart the plant in the near future. A list of ACNFS public meetings dealing with the RFP is shown on attachment 1. Attachment 2 lists ACNFS recommendations on a variety of Rocky Flats issues. We have been pleased by your and the Department's positive response to our recommendations. Attachment 3 lists reports we used or are currently reviewing in connection with Rocky Flats issues and plans.

In the interest of keeping the public informed, the Committee staff has sent to Public Document Rooms a copy of ACNFS meeting transcripts and our reports to you and the Congress.

The Committee will hold a public meeting in Golden, Colorado on April 25, 1990, to discuss the EG&G Resumption Plan and other related RFP issues. If enough information is available, we plan to discuss our conclusions at the May Committee meeting and provide you with our recommendations shortly thereafter.

I would be pleased to discuss this information and our plans at your convenience.

Sincerely,

John F. Ahearne

John F. Ahearne
Chairman

Attachments

Attachment 1

## ACNFS PUBLIC MEETINGS WHICH ADDRESSED ROCKY FLATS ISSUES
(Since September 1989)

| MEETING DATE | SITE | TYPE | DATE OF REPORTS TO THE SECRETARY |
|---|---|---|---|
| October 11-12, 1989 | Golden, CO | Public | November 30, 1989 * |
| December 11-12, 1989 | Washington, D. C. | Public | January 29, 1990 * |
| February 20-21, 1990 | Washington, D.C. | Public | March 28, 1990 * |
| April 25, 1990 ** | Golden, CO | Public | To Be Determined |

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* Available at DOE Public Document Rooms (PDR)
Transcripts of open ACNFS meetings also in PDR

** Planned Public Meeting

Attachment 2

## ACNFS RECOMMENDATIONS REGARDING THE ROCKY FLATS PLANT

In its letter to Secretary Watkins of November 30, 1989, the ACNFS made the following recommendations for improving the safety and environmental aspects of operations at Rocky Flats:

1. "We recommend the DOE and the contractor continue to use PRA results to reduce vulnerabilities in design and operation."

2. "The Mattson study [re Pu accumulation in ducts] recommended further analysis of human errors and component reliability, including common mode failures. We support these recommendations."

3. "We see many symptoms which lead us to believe that the contractor-to-contractor transition at RF will have many of the problems currently being experienced at Savannah River. EG&G will need to introduce new attitudes and new practices. A safety culture must be established and the operating staff must assume the responsibility of making the facility a professional place - it is not today."

4. " ...the overall hydrology of the site and the relationship among the many sources of pollution are not well understood. ...The proposed blocking actions to put physical barriers in place to control the spread of groundwater contamination from contaminated on-site soil appear to be sensible. ...it is also clear that the management has not integrated environmental issues into the overall management plan."

5. "Unless prevented by a non-waivable regulatory constraint, supercompacter construction should resume and at an accelerated pace. Work to obtain the necessary permits should proceed in parallel."

6. "This laxness of operation [regarding the changing of anti-contamination clothing]...obviously has the approval of the highest level of management. This practice should be halted. Furthermore, a change to a more conservative and professional set of practices would be an effective way to signal that the old way of doing business cannot continue."

7. "Based on data provided to the Committee on the magnitude of past Pu releases, it appears unlikely that measurable health effects would have occurred among members of the community. Nevertheless, to provide an adequate basis and to alleviate public concerns, we believe the DOE should proceed with epidemiological studies in the area. The DOE should consider funding an independent organization, in addition to the state, to take air and soil measurements at and near RF. Such an organization should be chosen by a group consisting of representatives of DOE, state agencies, and the local opposition groups."

8. "The DOE should open at least one public document room (PDR) where the public can have ready access, not at the plant, where the PDR is currently located. The DOE should ensure the PDR is stocked with the pertinent unclassified documents and should add new documents upon their release. In stocking the PDR, the DOE should err on the side of completeness."

9. "The emergency management system should be examined to ensure the assignment of who will be in charge is explicit and understood at all times."

   The ACNFS expanded on this recommendation in its January 29, 1990 letter to Secretary Watkins when it said, "We believe that responsibility for the management of a site emergency should be left unambiguously to the plant management, with DOE as an interested witness. Clearly there may be times when the public interest requires that the Department relieve the plant management of this responsibility, in which case the change of command should be declared and unambiguous — We strongly recommend that it be made clear to all concerned DOE and contractor personnel that it is DOE policy that a site manager has clear authority to make timely off-site notifications when necessary."

10. "The DOE line organization has been authorized to hire additional staff to improve contractor oversight. ...The DOE should develop a plan to ensure qualified people are hired, properly trained, and deployed where they are most needed."

In its March 28, 1990 letter to Secretary Watkins, the ACNFS "expressed concerns about:

- o the standards to be used for the resumption of operations,
- o The criteria for determining which issues are restart issues and how they are met, and
- o whether EG&G can continue to attract high-level management attention from the parent company, necessary to keep the plant running well."

ROCKY FLATS PLANT DOCUMENTS ATTACHMENT 3

01- U.S. Department of Energy, Headquarters, Office of Nuclear Safety, Technical Safety Appraisal of Building 707, Rocky Flats Plant, DOE/EH-0021, September 1986.

02- U.S. Department of Energy, Headquarters, Office of Nuclear Safety, Technical Safety Appraisal, Rocky Flats Plant, DOE/EH-0032, January 1987.

03- U.S. Department of Energy, Office of Safety, Helath and Quality Assurance, Restart Strategy for Rocky Flats Building 771, Memorandum from R.W. Starostecki to B.G. Twining, December 5, 1988.

04- U.S. Department of Energy, Office of Safety, Health and Quality Assurance, Technical Safety Appraisal of the Rocky Flats Plant, DOE/EH-0081, Memorandum from R.W. Starostecki to B.G. Twining, January 27, 1989.

05- Rockwell International, Building 707 Final Safety Analysis Report, September 26, 1988.

06- Rockwell International, Building 771 Final Safety Analysis Report, September 1988.

07- Rockwell International, Building 774 Final Safety Analysis Report, September 1988.

08- Rockwell International, Building 371 Final Safety Analysis Report Volume 1, July 15, 1981.

09- Rockwell International, Building 559, Final Safety Analysis Report, June 1987.

10- Rockwell International, Final Safety Analysis Report, Building 776/777, June 1987.

11- Rockwell International, Final Safety Analysis Report, Building 779, June 1987.

12- Rockwell International, Pondcrete Overview, Presentation to the Advisory Committee on Nuclear Facility Safety, March 2, 1989.

13- Rockwell International, Safety Self-Improvement Program, March 1, 1989.

14- U.S. Department of Energy, Albuquerque Operations Office, Response to Question by the Ahearne Committee on the Rocky Flats Plant Technical Safety Appraisal (TSA) Report, Memorandum from D.L Krenz to P.D. Grimm , March 13, 1989.

15- U.S. Department of Energy, Albuquerque Operations Office, Rocky Flats Safety Perforamce Review-Technical Accuracy of Draft

Safety Performance Review Report, Memorandum from A.E. Whiteman to W.R. Korneck, March 24, 1989.

16- Rockwell International, Building 371 PROVE-Safety Assessment (Revised Feb. 1988), November 1987.

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TIMOTHY E. WIRTH
COLORADO

COMMITTEES:
ARMED SERVICES
BANKING
BUDGET
ENERGY AND
NATURAL RESOURC

United States Senate
WASHINGTON, DC 20510-0603

April 3, 1990

The Honorable James Watkins
Secretary of Energy
Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Secretary:

I am writing to seek clarification from the Department of Energy on several issues relating to the Rocky Flats Plant.

Last year, the Congress appropriated $140 million for corrective activities, environmental restoration, and waste management at Rocky Flats. This year, although the problems at Rocky Flats continue to mount, the Bush Administration request for environmental activities at Rocky Flats in FY 1991 decreased to $89 million -- a $51 million reduction from last year's level.

EG&G, the new contractor at Rocky Flats, estimated in the its second Five Year Plan of February 1990 a total FY91 budget requirement of $208 million, and press reports indicate that Leo Duffy, Director of the DoE Office of Environmental Restoration and Waste Management, recently stated that the requested funding for FY91 may be insufficient to keep the clean-up at Rocky Flats on schedule. Congress is not alone in believing that significantly greater sums than requested by the Administration are required for environmental clean-up and management at Rocky Flats.

The shortfall in environmental funding is all the more puzzling in light of the Department's request to proceed with a $65 million Environmental Impact Statement to construct a new Building 371 at an estimated cost of $500-600 million. The National Academy of Science report last year questioned the need for modernizing Building 371, and you have not yet presented your own version of the "2010" study, which called for relocation of Rocky Flats beginning in 1995. While I agree with the need to provide for the safety of workers as elements of Rocky Flats are decommissioned, I question whether that is the primary purpose of the proposed construction at Building 371.

An assessment of the least-cost design to meet that decommission function would help clarify the relative importance of the various functions for which Building 371's successor is being considered. It would also be useful to have DoE's long-term plan for Rocky Flats in hand before committing additional sums for large modernization projects, which will extend the life of this plutonium reprocessing center in the Denver metropolitan area well into the next century.

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PUEBLO, CO 8

At the Energy Committee hearing this morning, I understood you to indicate that operations at Rocky Flats would not resume until and unless the two independent commissions -- the Advisory Committee on Nuclear Facility Safety and the Defense Facilities Safety Oversight Board -- have certified that appropriate corrective actions have been implemented and that RFP is safe to reopen. Again, I welcome your intent to place environment, safety and health considerations above production. As I pointed out this morning, neither of the independent commissions has completed its work so it is difficult to see how Rocky Flats can be restarted as early as you indicated in testimony before the House Armed Services Committee last week.

Consequently, it would be extremely helpful to have a schedule of events and timetables. I would like to reiterate the request I made at this morning's hearing that the DoE prepare a simple public document listing:

o all of the problems the various reports on RFP have found (the "Tiger Team" Assessment, the Matteson Assessment of Criticality Safety, DoE Environmental Surveys, Technical Safety Analyses and the recommendations of the Ahearne Committee on Nuclear Facility Safety);
o corrective actions DoE and EG&G intend to take;
o the schedule for corrective actions;
o who is responsible for corrective actions;
o and the estimated cost of the various corrective actions.

For example, when your "Tiger Team" visited Rocky Flats last July, DoE indicated that their assessment would be followed within sixty days with an action plan. We still have not seen that action plan. EG&G has a restart plan, but there remain many blanks in it. I believe that DoE should prepare a document for public review before restart at Rocky Flats proceeds. Such an effort would help rebuild public confidence in DoE operations by providing the public with a comprehensive and comprehensible plan of action.

Thank you for your consideration of these requests.

With best wishes,

Yours sincerely,

Tim Wirth

Timothy E. Wirth

The CHAIRMAN. Thank you very much.

Senator Domenici has two more questions which he says are absolutely essential.

Senator DOMENICI. Mr. Secretary, when you came on you decided to make a significant change in both attitude and determination regarding the Environmental Protection Agency's role in this repository and compliance with their rules, regulations and standards.

You have stated unequivocally that DOE must comply with EPA's disposal standards at WIPP. That has received very positive acclaim.

On the other hand, I seem to be reading that as far as determining whether or not you have complied that we have a special circumstance here, in that DOE will determine compliance rather than EPA.

I do not believe that we do that for anyone else in the country. I mean, if it is a steel mill and you have to meet EPA standards, EPA determines whether they have been met.

Would you have any objection if we include in our withdrawal bill, whenever it occurs, that EPA will do the certifying of compliance?

Secretary WATKINS. Well, Senator Domenici, we do have, as you know, already in no-migration petition the whole issue addressed of disposal standards, so that is part of the no immigration petition negotiation with EPA. They are not going to let us set our own standards. They are going to set the standards, and they are going to see that we comply with it, and we will have to submit to them all our records to show that we have in fact complied with the EPA standards.

The normal process is for EPA to set the standards for us to comply with, and we will inform them of how we have complied with it, and they will review those documents.

So you can do it if you like, but I do not think it is necessary.

Senator DOMENICI. It seems to me that has been an ongoing issue. I thought you had a change of attitude that you were not going to continue to be a self-certifying entity, that you would like to get that off your back in a number of areas. I know it is going to be debated on this bill, and I have your testimony. You are not seriously in opposition.

Secretary WATKINS. I would be pleased to prepare an MOU. In fact, I intend to do that with ourselves and EPA on that very issue so that it does not look like we are trying to pull the wool over somebody's eyes. I am ready to do that, but if you think legislation is necessary to prove the point, it is hard for me. We are going to do the same things anyway.

Senator DOMENICI. I will submit the second question for him to answer in writing.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Admiral Watkins.

Thank you, Mr. Duffy.

Our next three witnesses we must deal with as a panel. Time will not permit otherwise. So at this time we will have Don R. Clay, Assistant Administrator for the Office of Solid Waste and Emergency Response of EPA; Paul Rice, Chairman of the Subcommittee on the Waste Isolation Pilot Plant of the Advisory Committee on Nuclear Facility Safety; and Dr. Charles Fairhurst, Chairman of the Panel on the Waste Isolation Pilot Plant, Board on Radioactive Waste Management of the National Research Council in Washington.

Gentlemen, I apologize to you because our time has gotten away from us. Your written statements will be submitted, and I would appreciate your summarizing so that we will have time for some questions.

We will begin with Mr. Clay.

## STATEMENT OF DON R. CLAY, ASSISTANT ADMINISTRATOR, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY J. WILLIAM GUNTER, DIRECTOR, CRITERIA & STANDARDS DIVISION, OFFICE OF RADIATION PROGRAMS

Mr. Clay. Thank you, Mr. Chairman. I am pleased to be here this morning to discuss EPA's proposed decision on the DOE no migration petition, the one that I signed yesterday. This proposes a conditional variance which, if granted, would allow DOE to place waste into the Waste Isolation Pilot Plant (WIPP) for purposes of testing and evaluation without the pretreatment that otherwise would be required under the land disposal ban.

I think it is important to emphasize that the petition covers only the hazardous waste component of the mixed waste; it does not deal with the radioactive component. It deals just with the hazardous waste.

As Mr. Duffy and the Secretary just said, it is a relatively small part of the whole waste that will be placed in the WIPP during the test period.

We also provide certain conditions were we to grant this variance that would have to be met. This includes the waste only for testing and experimental programs, so the operations phase would not be covered by this. Again, as the Secretary said earlier, waste must be readily retrievable, so if it does not work out then it must be retrieved.

As I said earlier, it will not cover the operations and demonstration tests. We also require certain air monitoring. We also require waste characterization as they put waste there. We require a carbon absorption control device system. And finally, we require annual reports to EPA.

We believe the site is promising for permanent disposal, but the DOE must demonstrate the no-migration over the long term, and this test is the first step in that process.

DOE will be required to re-petition us for a permanent variance to do that, or if they want to do the operational demonstration, or if they significantly vary from the conditions that we are talking about in this proposal.

We believe that, under the conditions that are described in the proposal, we are protecting the human health and the environment for this period of tests.

The next steps will be that we will publish this in the Federal Register; it is already on its way. Hopefully it will be published this

Friday. We will have a public comment for 60 days, which is longer than we normally allow for a site-specific decision. Because of the intense interest in this, we allowed additional time. We are planning two public hearings, one in Carlsbad, Mr. Chairman, and several days in Albuquerque, and plan to have a final decision in the September time frame.

Additionally, EPA supports the Administration's land withdrawal legislation, allowing the project to proceed. We are also planning to propose our standards for disposal of the transuranic waste for the radioactive waste—this is a different subject—and we anticipate that rule to be proposed in late 1990, with the rule going final in mid-1992.

With that, I would be pleased to stop and put the full statement in the record.

Thank you.

[The prepared statement of Mr. Clay follows:]

# STATEMENT OF
# DON R. CLAY
# ASSISTANT ADMINISTRATOR
# OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
# U.S. ENVIRONMENTAL PROTECTION AGENCY
# BEFORE THE
# COMMITTEE ON ENERGY AND NATURAL RESOURCES
# U. S. SENATE

APRIL 3, 1990

Good morning Mr. Chairman and members of the Committee. I am Don Clay, Assistant Administrator for Solid Waste and Emergency Response at the U.S. Environmental Protection Agency (EPA). I appreciate your invitation to appear here today to discuss the Department of Energy's (DOE) plans for opening of the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico as well as the issue of land withdrawal of the public lands surrounding the WIPP site.

## OVERVIEW

EPA views the WIPP as an integral part of a national strategy for handling our nuclear weapons wastes in a manner protective of human health and the environment. Given its geological formation, the site appears promising for the permanent disposal of radioactive wastes, although both DOE and the Agency recognize that there are still outstanding issues related to its long-term acceptability. To address these issues, DOE wishes to conduct underground testing in the WIPP repository. As we have indicated to DOE in our comments on its test plans, we generally support DOE's test program as reasonable and appropriate.

## MIXED WASTE REGULATION

Under DOE's schedule, as we understand it, one of the critical elements in opening the WIPP is demonstration of compliance with the Resource Conservation and Recovery Act (RCRA) land disposal restrictions. As Assistant Administrator for the Office of Solid Waste and Emergency Response, I have the primary responsibility for ensuring that DOE is in compliance with these requirements and more generally with the regulation of the hazardous components of the radioactive mixed wastes ultimately destined for the WIPP.

Since 1986, DOE, EPA and the Nuclear Regulatory Commission (NRC) have recognized that the regulation of mixed waste falls under both RCRA and the Atomic Energy Act (AEA), -- the radioactive component of the waste is regulated by either DOE or NRC under the AEA, and the hazardous component is regulated by EPA under RCRA. In general, under the AEA, EPA's role is limited to issuing generally applicable environmental standards, NRC regulates commercial facilities and most Federal facilities other than DOE, and DOE regulates itself.

The RCRA program, as a general rule, is implemented through delegated State programs. On March 19, 1990, we proposed that the State of New Mexico be authorized to regulate mixed hazardous and radioactive wastes. When New Mexico is authorized -- currently expected to be in June, 1990 --- mixed waste becomes a RCRA regulated waste in that state.

## LAND BAN

Once New Mexico has been authorized, mixed wastes disposed of at the WIPP will become subject to the land ban provisions in Section 3004(d)-(h) of the Hazardous and Solid Waste Amendments of 1984 (HSWA). HSWA directed EPA to develop treatment standards, using Best Demonstrated Available Technology (BDAT), that hazardous wastes must meet before they may be disposed of on the land. Once the land disposal prohibition goes into effect, waste cannot be placed in a land disposal unit unless it has been treated to meet or otherwise meets BDAT standards or unless the Administrator determines that the prohibition is not required in order to protect human health and the environment for as long as the waste remains hazardous. This determination may be based on a demonstration by a facility owner/operator that, to a reasonable degree of certainty, there will be no migration of hazardous constituents from the disposal unit for as long as the waste remains hazardous.

As you know, DOE submitted a no-migration variance petition to EPA that, if granted, would allow placement of the mixed wastes in the WIPP without treatment to BDAT.

## DOE'S NO MIGRATION PETITION

DOE originally submitted its No Migration Variance Petition in March, 1989. While the petition contained a great deal of information, additional underlying data to support DOE's position was necessary. Thus, between June and November 1989, we requested that DOE provide this underlying information, and including more detailed information on waste characterization, seal design, air monitoring and other questions. This resulted in DOE submitting a complete petition in January, 1990. The Agency has completed its evaluation of the petition. In response, I signed yesterday a proposed, conditional variance that would allow DOE to place untreated mixed wastes into the WIPP for the purpose of testing and experimentation.

## DECISION ON THE NO MIGRATION VARIANCE PETITION

EPA's proposed decision would allow DOE to place mixed wastes subject to the RCRA land disposal restrictions in the WIPP repository for testing and experimentation to determine whether the site is appropriate for the long-term disposal of mixed wastes. The proposed variance would allow testing and experimentation designed to show the long-term acceptability of the WIPP. DOE will not be placing any wastes underground for purposes of demonstrating that the facility is ready to operate. Furthermore, DOE will remove all restricted wastes from the repository if DOE is unable to demonstrate no migration of hazardous constituents over the long term. (It should be noted that DOE has committed to conducting such a removal in its no migration variance petition, as well as in a consent agreement with the State of New Mexico.) Other conditions placed on DOE in EPA's proposed decision are:

- All wastes placed in the WIPP would have to be placed in a readily retrievable manner.
- DOE would have to provide to EPA annual written reports on the status of DOE's performance assessment during the test phase and an annual summary of air monitoring data.
- DOE would have to install and operate a carbon adsorption control device designed to achieve a control efficiency of 95% in the discharge system of the bin experiment rooms.
- DOE would have to implement an air monitoring plan.
- Before placing waste in the repository, DOE would have to certify to EPA that it has secured control of the entire surface and subsurface at the WIPP site.
- DOE would have to provide to EPA the results of waste characterization and analysis performed on the waste to be emplaced into the WIPP during the test phase.

Although today's proposed variance is specifically based on a finding of no migration of hazardous constituents from the unit during the test phase, EPA has thoroughly reviewed available information on the expected long-term performance of the WIPP repository. Given the geological stability of the area, the depth, thickness and the very low permeability of the salt formation in which the repository has been mined, and the properties of rock salt as an encapsulating medium, EPA believes that the WIPP is a promising site for a permanent mixed waste repository. Nevertheless, a number of uncertainties related to the long-term performance of the WIPP remain: for example, the extent and effects of gas generation. DOE will be investigating these uncertainties in the test phase at the WIPP, and it will review whether technical modifications to the repository design or waste are necessary to meet applicable regulatory standards.

Before DOE can permanently dispose of untreated mixed wastes in the WIPP, it must demonstrate no migration over the long term; that is, it must successfully address current uncertainties about long-term WIPP performance. Information gathered by DOE during the test phase will be central to such a demonstration. Any decision to grant (or deny) a variance for permanent disposal will be made with full opportunity for public comment, as prescribed in 40 CFR 268.6(g).

Once our proposed decision has been published in the Federal Register, there will be a 60-day comment period, ending in June. In addition, two public hearings have been scheduled on our proposed decision: one in Carlsbad and the other in Albuquerque, New Mexico. Our current schedule would have EPA finalize this decision this September.

**WASTE AMOUNTS**

DOE has indicated that it expects to ship approximately 4,900,000 cubic feet of transuranic waste to the WIPP repository during its operating life. DOE estimates that approximately 60% will be "mixed waste".

Furthermore, DOE only proposes to ship approximately 0.5% of TRU wastes expected to be sent to the WIPP for the initial test program. (Another 1.5% is being considered for two full-scale pilot rooms as recommended by EPA, but this will be subjected to a feasibility study by DOE and would not occur until later in the test program. In addition, under EPA's proposal, DOE would be required to modify its no-migration petition before emplacement of the wastes in the two pilot rooms as currently envisioned -- e.g. backfilled without stand-off walls. If EPA proposes to approve the modification, it will be subject to notice and comment in the Federal Register.) Thus the actual amount of hazardous constituents that will go to the WIPP during the initial test program is relatively low. During the test period, for example, we estimate that only the equivalent of about 140 drums of hazardous organic chemicals will be placed in the WIPP. These are the organic constituents addressed in the non-migration petition. There will, of course, also be significant amounts of hazardous metals like lead as well, although these wastes will generally not be in a readily available form. For example, the lead is contained in such articles as leaded rubber gloves, shields or glove boxes and therefore will not easily release into the environment.

## STATUS OF 40 CFR PART 191 STANDARDS

EPA is proceeding with its program to reissue its standards for disposal of transuranic radioactive wastes. We are now planning to propose the standards in late 1990 and anticipate a final rule in mid-1992. The standards for management and storage of transuranic wastes are currently in effect. These standards would not be legally applicable to the WIPP unless and until it is designated as a disposal facility. However, DOE has committed to complying with these standards during the test phase at the WIPP.

## LAND WITHDRAWAL

EPA has also been asked to comment on land withdrawal for the WIPP project. As I have discussed earlier, we believe that the WIPP is a promising project and that DOE should move ahead as soon as it has satisfied the necessary regulatory requirements with its underground experimental program. Consequently, EPA supports the Administration's land withdrawal legislation allowing the project to proceed.

## CONCLUSION

In conclusion, I appreciate the opportunity to provide EPA's perspective on these issues. The WIPP is a unique facility which has the potential to provide important disposal capacity for mixed radioactive and hazardous waste. It is a project with significant promise, although some work still needs to be done to demonstrate final acceptability.

EPA intends to play a strong role in the WIPP to ensure a thorough exploration and resolution of all outstanding issues, and to ensure that the final repository is in compliance with all environmental laws and is fully protective of human health and the environment.

The Agency also intends to work closely with New Mexico, once the State is authorized, by providing technical assistance and oversight regarding all RCRA-related activities at the WIPP.

This concludes my prepared statement. I would be happy to respond to any questions you may have at this time.

The CHAIRMAN. Thank you very much.

Next, Mr. Paul Rice, Chairman of the Subcommittee on WIPP from the Advisory Committee on Nuclear Facility Safety.

Mr. Rice.

## STATEMENT OF PAUL D. RICE, ADVISORY COMMITTEE ON NUCLEAR FACILITY SAFETY

Mr. RICE. Thank you, Mr. Chairman.

If you are going to put my remarks in the record, I will even summarize those that I submitted. Attached to the comments is a report from the Advisory Committee on Nuclear Facility Safety to the Secretary of Energy in December, which lays out the details of the Advisory Committee's review of the WIPP project.

In short summary, the Committee's review and the report to the Secretary really breaks down into two categories of findings. One was the long-term environmental effects of the WIPP facility. The other had to do with the safety issues related to the day to day conduct of operations.

On the environmental effects side, you have heard a good bit of discussion today concerning the 40 CFR part 191, subparts A and B, and our recommendations, Senator, center on the Department's need to show compliance with those two parts.

The Committee concluded that based on everthing that we saw, that the Department would not have a problem in showing compliance with subpart A, which would allow them to proceed with the experimental test program.

Subpart B is a more difficult situation as you have heard today. It involves issues such as the gas generation questions, which has been discussed, and also showing long-term compliance with EPA standards, including the difficult issue of human intrusion. That has also been previously discussed.

In summary, the Committee made——

The CHAIRMAN. As I understand it, we must prove that it is impervious to assault by two different drill bits going through within a hundred years. Was that the rule I understood?

Mr. RICE. There are a number of scenarios, Mr. Chairman. One of them concerns undisturbed conditions, which has to do with the way the geosphere will deal with all the natural events that could come up over a 10,000-year period. We call that undisturbed performance. And then there are disturbed conditions or the human intrusion performance which considers likelihood of someone drilling into that facility and through a waste panel during that same period, thus, releasing the radionuclides.

The CHAIRMAN. But two holes, I understand?

Mr. RICE. There are a number of different scenarios. There could be more than two. There could be two. It depends on the assumptions that are made in the probabalistic analysis that is performed.

And, in fact, that is part of our recommendations to the Department. That in the assumptions used in the analysis, the Department needs to carefully think out their assumptions for the human intrusion scenarios. The Department needs to interface with the EPA, and determine whether or not they have used realistic judgments in the assessments and those assumptions.

That is one of our recommendations in our graded approach.

We have completed our task in the sense that we performed our review and we have submitted our recommendations to the Secretary. And we have been informed that the Department is addressing all of those issues, and that we will be informed of the results or their disposition in the near future.

So I do not specifically know what their final analysis has considered or has not considered yet.

The second area of the ACNFS review had to do with the day-to-day operations at the WIPP facility. There we reviewed the actual dry-run operations. We reviewed issues that had been raised by previous groups, and we discussed the various issues with management of both DOE and the operating contractor for the DOE.

We found a number of issues, many of which have been raised in previous reviews, which we believed needed to be completed before the facility could start safely. We have pointed out those recommendations. They included such areas as the quality assurance program, the need to strengthen the organization in the area of radiological management and the need to perform a final analysis in the area of fire protection. Those are examples of the specifics that are in the report.

All of those areas we thought were solvable. They had been, in most cases, raised in previous reviews. The Department had initiated action on a number of them, and we felt confident the Department could resolve them.

The CHAIRMAN. Is not the human intrusion factor one of your more difficult ones?

Mr. RICE. It is. And that pertained, Mr. Chairman, primarily to the long-term environmental effects. The last part that I was describing had to do more with the day-to-day operation.

[The prepared statement of Mr. Rice follows:]

**Statement of Paul D. Rice**
**Member of the Advisory Committee on Nuclear Facility Safety**
**Before the**
**Senate Committee on Energy and Natural Resources**

April 3, 1990

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, I WOULD LIKE TO EXPRESS MY APPRECIATION FOR YOUR INVITATION TO THE DOE ADVISORY COMMITTEE ON NUCLEAR FACILITY SAFETY (ACNFS) TO PRESENT THE RESULTS OF ITS REVIEW ON THE WASTE ISOLATION PILOT PLANT. CHAIRMAN AHEARNE ASKED THAT I EXPRESS HIS REGRETS FOR NOT BEING ABLE TO BE HERE TODAY. I AM A MEMBER OF THE ADVISORY COMMITTEE AND CHAIRMAN OF THE ACNFS SUBCOMMITTEE FOR THE WIPP REVIEW. I AM REPRESENTING THE FULL COMMITTEE TODAY.

THE RESULTS OF THE ACNFS REVIEW OF THE WIPP FACILITY ARE CONTAINED IN A REPORT TO THE SECRETARY OF THE DEPARTMENT OF ENERGY, ADMIRAL WATKINS, DATED DECEMBER 11, 1989. A COPY OF THAT REPORT IS ATTACHED TO MY PREPARED REMARKS FOR THE RECORD. THE INFORMATION ON WHICH OUR REPORT IS BASED WAS GATHERED LAST SUMMER. WE HAVE COMPLETED THE SPECIFIC REQUEST OF THE SECRETARY. WE HAVE BEEN ADVISED THAT THE DEPARTMENT IS REVIEWING OUR RECOMMENDATIONS AND WILL INFORM US OF THEIR DISPOSITION IN THE NEAR FUTURE.

THE FULL COMMITTEE VISITED WIPP IN JUNE 1989, AND SEVERAL MEMBERS OF THE SUBCOMMITTEE SUBSEQUENTLY REVISITED WIPP AND OTHER RELATED FACILITIES INCLUDING SANDIA NATIONAL LABORATORIES (THE DEPARTMENT'S SCIENTIFIC ADVISOR FOR WIPP), AND THE IDAHO NATIONAL ENGINEERING LABORATORY AND THE ROCKY FLATS PLANT (TWO SOURCES OF WASTE THAT WOULD BE SHIPPED TO WIPP).

THE COMMITTEE SELECTED A NUMBER OF AREAS FOR ITS REVIEW INCLUDING UNRESOLVED TECHNICAL ISSUES, THE FINAL SAFETY ANALYSIS REPORT, WIPP MANAGEMENT AND STAFFING POLICIES AND ACTUAL WORK PRACTICES IN THE FIELD. SEVERAL AREAS WHICH WERE NOT SELECTED FOR REVIEW BASED ON

THE NATURE OR TIMING OF THEIR SEPARATE RESOLUTION INCLUDED LAND WITHDRAWAL, RCRA NO MIGRATION PETITION, AND SHIPPING CONTAINER CERTIFICATION.

THE COMMITTEE'S FINAL REPORT TO THE SECRETARY INCLUDED A NUMBER OF OBSERVATIONS AND RECOMMENDATIONS THAT WERE GROUPED INTO TWO PRINCIPAL AREAS. THESE WERE LONG-TERM ENVIRONMENTAL EFFECTS, AND SAFETY ISSUES RELATED TO THE CONDUCT OF DAY-TO-DAY OPERATIONS. I WILL BRIEFLY SUMMARIZE THE ACNFS FINDINGS IN THESE TWO AREAS.

THE ISSUE OF LONG-TERM ENVIRONMENTAL EFFECTS CENTERS AROUND THE ABILITY OF WIPP TO MEET THE RADIATION PROTECTION STANDARDS FOR DISPOSAL OF TRANSURANIC WASTES DEFINED IN DRAFT 40 CFR PART 191. SUBPART A APPLIES TO MANAGEMENT AND STORAGE, WITH THE INTEREST AND CAPABILITY TO READILY RETRIEVE SUCH WASTES FOR SUBSEQUENT USE, PROCESSING OR DISPOSAL. SUBPART B DEALS WITH PERMANENT INTERMENT OF WASTE.

IN THE COMMITTEE'S OPINION, WIPP SHOULD BE ABLE TO MEET ALL SUBPART A REQUIREMENTS WHICH WOULD ALLOW THE DOE TO PROCEED WITH EXPERIMENTAL PROGRAM ACTIVITIES AS SOON AS CERTAIN PREREQUISITE OPERATIONAL ITEMS ARE COMPLETE AND ALL NECESSARY PERMITS AND APPROVALS ARE OBTAINED.

THE ABILITY OF THE WIPP FACILITY TO MEET THE LONG-TERM SUBPART B REQUIREMENTS IS MORE COMPLEX AND IS DEPENDENT ON RESOLVING SEVERAL OUTSTANDING TECHNICAL AND ANALYTICAL ISSUES. THESE PRIMARILY CENTER AROUND THE VERY LONG-TERM BUILDUP OF GASES GENERATED BY THE DECOMPOSITION OF METALLIC AND ORGANIC MATERIALS IN THE WASTE AND THE EFFECTS OF THIS GAS BUILDUP ON THE GEOLOGICAL STRUCTURE OF THE FACILITY. THE COMMITTEE BELIEVED THAT WORK TO RESOLVE THIS ISSUE WAS PROCEEDING PROPERLY WITH A HIGH PROBABILITY OF SATISFACTORY RESOLUTION. THE SECOND, APPARENTLY MORE DIFFICULT, PROBLEM INVOLVES THE EFFECTS OF POSTULATED HUMAN INTRUSION INTO THE FACILITY LONG AFTER IT IS FILLED AND SEALED.

FOR THIS CASE THE COMMITTEE POINTED OUT THAT THE RESULTS OF THE ANALYTICAL ASSESSMENT BEING APPLIED BY THE DEPARTMENT MAY BE UNREALISTIC IN CERTAIN CASES WHICH COULD CONTRIBUTE TO PROJECTED RELEASES THAT EXCEED EPA STANDARDS. EXAMPLES OF ANALYTICAL ASSUMPTIONS THAT, TAKEN COLLECTIVELY, MAY BE MORE CONSERVATIVE THAN REQUIRED INCLUDE A DRILLING EVENT WITH A PROBABILITY OF 1.0 FOR PENETRATING THROUGH A REPOSITORY PANEL, RESEALING THE BOREHOLE IN A MANNER THAT RESULTS IN POROUS MATERIAL(A CONDITION NOT CONSISTENT WITH PREDICTIONS OF CURRENT WIPP SEAL PERFORMANCE) AND NO CREDIT GIVEN FOR PASSIVE RECORDS AND MARKERS. THE COMMITTEE FURTHER NOTED THAT THE DRAFT EPA STANDARD, APPENDIX B OF 40 CFR 191, RECOGNIZES THAT DETERMINING EXPECTED PERFORMANCE OF SITES FOR LONG-TERM ISOLATION OF WASTES INVOLVES "REASONABLE PROJECTIONS" USING MODELS AND PARAMETERS THAT MAY REQUIRE "QUALITATIVE JUDGEMENTS".

THEREFORE, WE RECOMMENDED THE FOLLOWING GRADED APPROACH TO THE SECRETARY FOR THE RESOLUTION OF OUTSTANDING ENVIRONMENTAL ISSUES AND EMPLACEMENT OPERATIONS:

1. PERFORM AN ANALYSIS OF LONG-TERM PERFORMANCE RELATIVE TO EPA SUBPART B STANDARDS AS A BASIS FOR INITIATING THE EXPERIMENTAL TEST PHASE (BIN AND ALCOVE). THE TEST PHASE WOULD BE CONDUCTED IN COMPLIANCE WITH 40 CFR PART 191 SUBPART A AFTER ALL OTHER REQUIRED PERMITS/APPROVALS HAVE BEEN OBTAINED.

2. EMPLACE TRU WASTE FOR THE EXPERIMENTAL TEST PROGRAM UPON DETERMINING THAT THERE IS REASONABLE CONFIDENCE THAT WIPP CAN EVENTUALLY BE SHOWN TO MEET THE RELEASE QUANTITIES AND UNDISTURBED SITE DOSES AS REQUIRED BY EPA SUBPART B, INCLUDING A CAREFULLY CONSIDERED INTRUSION SCENARIO BASED ON "REASONABLE PROJECTIONS". THE BASIS FOR THESE PROJECTIONS SHOULD BE EXPLORED WITH EPA AS THEY APPLY TO INTRUSION AND DISTANT TIME FRAMES.

3. CONTINUE PERFORMANCE ASSESSMENT AND EXPERIMENTAL TEST PROGRAMS, INCLUDING STUDY OF THE GAS GENERATION ISSUE AND ENGINEERING ENHANCEMENT STUDIES TO GAIN HIGHER CONFIDENCE IN

THE EXPECTATION OF ACHIEVING COMPLIANCE WITH SUBPART B. IF THE DEPARTMENT FINDS IT NECESSARY TO USE THE EPA DEFAULT VALUES IN THE PERFORMANCE ASSESSMENT, IT WILL NEED TO CONSIDER USE OF ENGINEERING ENHANCEMENTS.

4. UPON DETERMINATION THAT A HIGH DEGREE OF CONFIDENCE EXISTS THAT EPA SUBPART B REQUIREMENTS WILL BE MET, INITIATE THE OPERATIONAL TEST PHASE AS A GRADED EMPLACEMENT PROGRAM COMMITTED TO DELIBERATE STEPS TO EVALUATE AND WORK OUT OPERATIONAL ISSUES IDENTIFIED IN VARIOUS REVIEWS.

5. AFTER FORMAL DOCUMENTATION OF COMPLIANCE WITH SUBPART B STANDARDS, IMPLEMENT THE FULL PROGRAM FOR LONG-TERM ISOLATION OF TRU WASTE.

THE SECOND AREA OF THE COMMITTEE'S FINDINGS AND RECOMMENDATIONS CENTERED AROUND ISSUES RELATED TO THE CONDUCT OF OPERATIONS AT THE WIPP FACILITY. THE COMMITTEE MEMBERS AND ITS CONSULTANTS REVIEWED WIPP POLICIES AND PROCEDURES, DISCUSSED ISSUES WITH THE MANAGEMENT AND STAFF OF BOTH THE DEPARTMENT AND ITS OPERATING CONTRACTOR AND OBSERVED DRY RUN OPERATIONS IN THE FIELD. FROM THESE, THE COMMITTEE POINTED OUT SEVERAL AREAS WHERE IMPROVEMENTS WERE NECESSARY TO ASSURE SAFE OPERATIONS. EXAMPLES OF THE COMMITTEE'S RECOMMENDATIONS IN THIS AREA INCLUDED THE NEED TO:

- STRENGTHEN THE WIPP ORGANIZATION STRUCTURE IN THE AREA OF RADIATION PROTECTION MANAGEMENT.

- COMPLETE SEVERAL REMAINING HARDWARE MODIFICATIONS AND VALIDATE THE PROPER OPERATION OF EQUIPMENT.

- EXPEDITE COMPLETION OF STAFFING AND TRAINING PLANS.

- PERFORM A FINAL EVALUATION OF FIRE PROTECTION PLANS AND PROCEDURES TO CORRECT ANY WEAKNESSES.

- REVISE CERTAIN PROCEDURES AND REPORTS TO INSURE COMPLETENESS AND CONSISTENCY WITH OBSERVED PRACTICES.

- CLARIFY ORGANIZATIONAL RESPONSIBILITIES TO INSURE AGAINST ANY CONFUSION WITH REGARD TO ACCOUNTABILITY.

OVERALL, THE OPERATIONAL ISSUES IDENTIFIED BY THE COMMITTEE WERE CONSIDERED TO BE READILY SOLVABLE AND WERE CONSISTENT WITH OTHER COMPREHENSIVE REVIEWS THAT ADDRESSED OPEN SAFETY ISSUES.

IN SUMMARY, ONCE THESE STEPS ARE TAKEN FOR THE OPERATIONAL AND LONG-TERM ISSUES ADDRESSED, WE BELIEVE THE WIPP WILL BE A RESPONSIBLE REPOSITORY FOR THE DISPOSAL OF TRU WASTE.

I WILL BE PLEASED TO RESPOND TO ANY QUESTIONS YOU MAY HAVE.

**Advisory Committee on Nuclear Facility Safety**
to the
United States Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

December 11, 1989

Honorable James D. Watkins
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Admiral Watkins:

As you requested, the Advisory Committee on Nuclear Facility Safety has conducted a brief but comprehensive review of the Waste Isolation Pilot Plant (WIPP) Project. The purpose of this report is to provide our assessment of those elements of the project that relate to health and safety and to identify potential safety concerns.

The major observations and perspectives discussed below are derived from analyses of selected issues from several key areas. The key areas included unresolved technical problems, the Final Safety Analysis Report (FSAR), and WIPP management, organization and staffing policies and practices. Certain areas were not selected for review based on the nature of their separate resolution (i.e., Land Withdrawal, RCRA No Migration Petition, and certification of the TRUPACT shipping container) or lack of full program development (i.e., Remote Handled TRU waste).

The review involved the full committee. However, much of the detailed review was performed by the WIPP Subcommittee which was chaired by Paul Rice, and included committee members William Kastenberg, James Martin, M. J. Ohanian, Robert Seale and Gerald Tape. In addition, Thomas Pigford and Konrad Krauskopf assisted us in the assessment of unresolved technical issues. Other expert consultants assisted in examining the adequacy of the FSAR and the conduct of operations. A complete list of consultants and staff is appended. The full committee visited WIPP in June 1989, and several members of the subcommittee made a follow-up visit to the WIPP site in August 1989. In addition, subcommittee members visited the Sandia National Laboratories, the Rocky Flats Plant, and the Idaho National Engineering Laboratory.

The committee commends the Department for its support and encouragement of reviews and analyses from organizations external to WIPP line management. Important input has been provided by the State of New Mexico Environmental Evaluation Group, the National Academy of Sciences, and the Department's own Environmental, Health and Safety reviewers. The committee has considered the inputs and recommendations from these sources.

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You have established requirements for the Department's nuclear activities that we found to be particularly relevant to our review of WIPP. These are (1) the long-term protection of public health and the environment and (2) a culture of management and operation that clearly demonstrates a commitment to excellence by agency and contractor managers and employees. Although we examined many details and could comment on numerous specifics (most of which have been identified in other reviews), we believe our best service to you is to provide comments and recommendations on the more important issues. We have organized our discussions and recommendations that follow into two major sections. First, we discuss the long-term environmental performance of WIPP. Second, we discuss issues which are more of a short-term nature and provide recommendations on actions necessary to assure safety in the day-to-day conduct of operations.

## Long-Term Environmental Performance

### Environmental Standards

The major issue for interment of TRU wastes in WIPP is whether reliable long-term isolation occurs. The Department acknowledges this requirement; however, it has not yet assembled and published in a suitable form the results of work it has done to show how WIPP is expected to perform against the Environmental Protection Agency (EPA) standards.

You have indicated that DOE will comply with 40 CFR Part 191, Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High Level and Transuranic Wastes. Here we consider only TRU waste. Subpart A applies specifically to management and storage, with the interest and capability to readily retrieve such wastes for subsequent use, processing or disposal. For the purpose of carrying out in situ tests and experiments and for gaining operations experience, Subpart A requirements are satisfactorily met. The ultimate objective of WIPP is to demonstrate and to become a "disposal" site, that is to provide for permanent isolation of TRU waste from the accessible environment with no intent of recovery. Subpart B, Sections 13 (containment) and 15 (individual protection) set forth the requirements directly applicable to WIPP. (Note that Subpart B is in the process of revision; for reference purposes, the draft revision is used here.)

The Department's scientific advisor for WIPP, Sandia National Laboratories, has prepared a systems analysis involving long-term radionuclide transport and dose assessment (SAND 89-0462), in which potential health effects to individuals are calculated for several hypothetical scenarios but not specifically compared with EPA standards. When the EPA default parameter values are used in the deterministic assessment, the results may, in some cases, be unecessarily conservative. Nevertheless, except for human intrusion, all of the scenarios lead to limits that could be expected to satisfy EPA requirements. To be more specific:

- If the expected results of the ongoing gas generation assessment and "representative" properties of waste, backfill, and borehole sealing can be confirmed, then the performance assessment should provide a high degree of confidence that the undisturbed performance of the WIPP is not expected to result in any release of radionuclides to the Culebra Dolomite or to the surface for well over 10,000 years.

o If the results or properties are worse than those now assumed, it should be possible to gain the high degree of confidence of compliance by initiating engineering modifications to the waste or to the facility (e.g., backfill).

The results presented for the human-intrusion scenario are deterministic and may be physically unrealistic when taken as a whole "because each calculation assumes different repository and geosphere characteristics." (Sandia Report SAND89-0462, April 1989). Therefore, the parameters lead to projected releases that may exceed EPA standards. This scenario includes a drilling event with a probability of 1.0 for penetrating through a repository panel and connecting a brine pool in the lower Castille formation with an upper aquifer; a flow pattern of Castille brine within a panel that allows the emergent brine to have a radioactive concentration based on the solubility of the elements in brine; sealing of the borehole in a manner that results in porous material (a condition not consistent with predictions of current WIPP seal performance); and no credit given for passive markers and records. While we understand the desire to satisfy EPA requirements using conservative parameters, we believe that the assumptions used in the intrusion scenario, taken collectively, may lead to an overall condition that is more conservative than necessary.

The EPA standards and implementing guides recognize that determining expected performance of sites for long-term isolation of wastes involves "reasonable projections" using models and parameters that may require "qualitative judgments"(the quoted terms are from Appendix 3 of 40 CFR 191). In this regard, we believe that the Department should develop a carefully considered intrusion scenario that would include considerations such as expectations for future borehole sealing at least as good as the current state-of-the-art and the effects of Department actions to provide passive markers and records. Such a scenario should take into account what future humans can be expected to do, since we must believe they will exercise reasonable care about their environment and be aware that failure to take basic precautions in areas such as monitoring and borehole sealing could adversely affect their environment. If the intruder scenario is considered with such "reasonable projections" as we believe are allowed by EPA guidance, especially in the area of borehole sealing, we expect WIPP can be shown to meet EPA long-term performance requirements with satisfactory margins of safety.

However, if the Department prefers to address the intruder scenario using the default values in the EPA guidance, then we believe that insufficient margins exist to demonstrate compliance and it will be necessary to soon plan for engineering enhancements of the waste and/or repository configuration. Since the issue is more one of which methodology should be used for demonstrating compliance with EPA Subpart B standards, not whether WIPP is indeed safe, we recommend that the Department take the lead to develop "reasonable projections" of long-term performance and interact with EPA on the adequacy of these important performance assessment inputs.

A "test phase" has been proposed in order to reduce the uncertainty in parameters such as brine inflow, solubility of waste forms, gas production rates, and gas/liquid two-phase flow, and to better confirm performance against EPA standards. The Department can use data from those experiments, to be obtained over the next few years while the waste is retrievable, to build additional confidence in the facility. However, it appears that these tests will not in-and-of-themselves provide the type of results that will significantly change performance assessment results currently being developed and scheduled for issue in December 1989. For this and other reasons discussed below, the Department should not delay its environmental performance assessment until such tests are done. Instead, the Department should proceed to prepare an assessment of the long-term environmental performance with the objective of laying out a basis for reasonable assurance that WIPP meets the EPA environmental standards and for obtaining a consensus among involved parties.

In our opinion, such a document is also essential to focus the "test phase" experiments and assure that they serve to reduce uncertainties in the performance assessment assumptions, to identify any engineering modifications that may be necessary to accommodate present TRU wastes, and to indicate whether justifiable improvements should be made in future waste forms to prevent or mitigate gas generation. The proposed tests could also be most useful in determining whether future waste forms can reasonably be improved (see below), a program we encourage.

We believe that, prior to your decision to allow emplacement of waste shipments underground at WIPP, it would be prudent for you to have a preliminary performance assessment that provides you with reasonable confidence that EPA Subpart B standards can eventually be shown to be met. This summary document should contain a carefully considered human-intrusion scenario and should clearly identify the key parameters and assumptions in the performance assessment that need to be addressed in the "test phase" to improve their certainty. When this has been done, we believe it would be proper to proceed immediately to the proposed in situ testing at WIPP when other ongoing prerequisite actions are complete. If the review of the performance assessment by involved parties provides a high degree of confidence that EPA standards will be met, as we expect, then you could proceed with the operational performance phase as a gradual emplacement program to evaluate and work out operational issues identified in various reviews. Of course, any decision to go to production-oriented operation will require assurance that EPA Subpart B standards are satisfied.

In summary, there appears to be acceptable confidence that the EPA requirements of Subpart A can be met to allow use of WIPP as a test facility and, therefore, to begin the emplacement of waste as part of the test program. The major technical issue facing WIPP is whether Subpart B can be met. From our review, we conclude that with the exception of the human-intrusion scenario, Subpart B requirements can be shown to be met using the work being completed by Sandia. The human-intrusion scenario, as developed by the DOE under its current application of EPA guidelines, is not likely to meet the present Subpart B requirements. We see three major options:

1. Plan that the test program will produce results that will enable Subpart B to be met. We believe this is unlikely because of the relatively short time for testing as compared to the time period for the key phenomena and the limited effect of the parameters tested on the human-intrusion scenario.
2. Abandon WIPP. We do not believe this is necessary, prudent, or responsible.
3. Further address the EPA Subpart B human-intrusion scenario requirements, an approach we recommend below. We see two basic parts for this approach:
    - a. Use more reasonable projections, for example, that future borehole seals would meet or exceed the current Sandia state-of-the-art form. DOE should take the lead to discuss these assumptions and approach with the EPA.
    - b. Examine what engineering modifications would be required to meet the Subpart B requirements without changing the current assumptions.

*Recommendations:*

> *The Department should promptly assemble the data necessary to provide reasonable confidence that WIPP can eventually be shown to meet the release quantities and undisturbed site doses as required by EPA Subpart B standards, including a carefully considered intrusion scenario based on "reasonable projections." Having established this confidence, initiate TRU waste emplacement in support of the performance assessment program.*
>
> *The Department should, upon determination that a high degree of confidence exists that EPA Subpart B requirements will be met, initiate the operational test phase as a gradual emplacement program committed to deliberative steps to evaluate and work out various operational issues identified in various reviews.*

## Gas Generation

Evaluation of the brine inflow question identified that the permeability of the salt formation was much less than originally thought. As a result, gas generated by radiolysis of water and organic matter in the waste, by bacterial decomposition of organic matter, and by corrosion of metal in the waste and its containers may produce high pressures in the repository because its escape is slowed by the impermeability of the surrounding salt. Current efforts by Sandia are focused on analysis to show whether potential gas buildup could result in a failure mode that would release unacceptable amounts of radionuclides to the environment and on methods of ameliorating gas buildup, if necessary. Members and consultants reviewed this issue, and we are of the view that DOE's evaluation program is proceeding properly.

The potential problem of gas generation raises questions concerning the current waste form and future DOE management of TRU wastes that are worthy of further review. Specifically, a reduction in the amount of metals and organics or a change in the form of organic materials could reduce the gas generation. We do not believe that an attempt to change the form of existing TRU waste would be justified in view of the risks and cost it would entail. Therefore, to the extent necessary, efforts to ameliorate gas generation within the repository appear to be the most reasonable approach. For future TRU waste, however, a different form that would reduce significantly gas generation should be considered. The engineering enhancement study underway should explore practical measures for reducing the quantities of decomposable waste, of using nonmetallic containers, and of stabilizing the waste by incineration or vitrification. Such measures could be beneficial if they can be conducted at reasonable cost and without appreciable risk to the personnel involved. Such an effort would be consistent with recently stated goals of improved waste management throughout the Department.

*Recommendation:*

> *DOE should continue its studies of ways of mitigating any undesirable build-up of gas pressure from the disposal of existing TRU waste and should investigate justifiable improvements in future TRU waste forms that would greatly reduce gas generation.*

## Safety Issues Related to Conduct of Operations

### Radiological Safety

Good radiological safety is perhaps the single most important aspect of day-to-day WIPP operations. Previous internal DOE reviews have identified numerous deficiencies and needed improvements which are being corrected. Critical action items remaining fall into the areas of equipment modifications, technician staffing, completion of training programs, and management personnel qualifications and attrition.

In the category of radiological equipment required for safe operation, the likely critical path for start-up involves the Continuous Air Monitors (CAMs). The CAMs have a long history of problems starting with poor designs, slow recognition and correction of the basic problems and questionable maintenance practices. Actions are in progress to resolve the CAMs issues. We also identified a design deficiency in the interlock system which, as currently installed, would allow the simultaneous opening of airlock doors that could expose the environment to potential or actual contaminated areas. Examples of other radiological equipment which must be completed for safe operation include the decontamination facility exhaust ventilation and contamination control equipment associated with unloading the TRUPACT shipping container.

Both Westinghouse and DOE WIPP management have identified that the current number of trained radiological technicians is not sufficient to start up without significant augmentation by the Westinghouse health physics professional staff or outside contract radiological technicians. Close management attention will be required to complete technician staffing and associated training, including off-site hands-on training, in order to insure a safe start-up. Several actions relating to radiological programs development need to be completed to insure long-term safety and credibility. These include accreditation of the WIPP dosimetry program and demonstration of the planned capability of the internal dosimetry program.

The committee observed that the WIPP Project has demonstrated a significantly improved trend in attention-to-detail and facility preparations during the first half of 1989. These improvements are due, in part, to the addition of competent health physics professionals and managers to the WIPP Project staff. In this regard, the committee has two fundamental concerns.

First, three different people have held the senior Westinghouse health physics manager position during the past year. We believe that stability in management staffing is important to maintaining the recent improvements in radiological protection and providing the vitality necessary for safe operations.

Second, DOE needs to emphasize the importance and priority of radiological activities to the safe and successful operation of the WIPP facility. Although radioactivity is the unique factor that differentiates WIPP operations from other industrial operations, current organizational reporting relationships (both Westinghouse and the DOE) would indicate that radiation safety is just another set of requirements for routine operations (This is not peculiar in DOE to the WIPP project). For example, WIPP organization charts and the FSAR show the senior manager directly responsible for all radiation programs is positioned at three levels below the top manager and one level below the managers of Public Affairs, Human Resources, and Administrative Services. Neither the FSAR nor WIPP organization charts indicate a direct access line to the senior facility manager.

*Recommendations:*

> *Define an organizational structure that provides senior radiation program management with sufficient authority and with direct access to senior Westinghouse facility management.*
>
> *Both Westinghouse and DOE management at WIPP provide close follow-up and attention to the completion of critical hardware actions and validation of equipment operation.*
>
> *Expedite completion of radiological staffing and training plans. Define formal contingency plans for attrition and develop procedures for requalification and testing of technicians.*

### Fire Protection

The WIPP facility has a number of impressive fire protection features including a loop-type fire main system above ground with a dual water supply capability including a diesel driven fire pump in case of loss of power. Underground areas are protected by a non-water fire protection system. The committee did have concerns regarding specific features in three areas.

First, the committee questions whether adequate risk analysis has been performed for the increased impact of a fire in the underground storage areas when a number of drums are exposed due to a lack of backfill. For example, the FSAR Waste Acceptance Criteria preclude packages that could sustain the propagation of fire from one drum or box to the next by limiting pyrophoric loading within drums and overpacking combustible boxes with metallic cladding. The basis of the FSAR exclusion is not clear, particularly in the area of characterizing the chemical source terms for combustion in old drums. Further, the apparent assumption that the only credible source for initiation of fires involving waste underground is the spontaneous combustion of a waste container falls short in view of other sources associated with normal and abnormal operations.

Second, the committee noted the lack of a smoke detection system in the high bay normal work area of the Waste Handling Building and questions whether this design feature is actually justified by administrative actions such as fire loading controls or routine watchstander inspection requirements.

Third, the committee is concerned that the water fire suppression system does not include the location of the Waste Handling Building exhaust high efficiency particulate air (HEPA) filters.

*Recommendations:*

> *A risk assessment of the pre-closure operations of WIPP, including a fire risk analysis addressing fires underground and the adequacy of fire detection and suppression systems, should be undertaken. This assessment should evaluate the acceptability of fire risks, should identify dominant contributors to this risk, and should evaluate and select among risk reduction tactics, if appropriate.*
>
> *Until a fire risk assessment can be completed to evaluate the specifics and focus on any necessary corrective actions, stringent administrative controls may be required to control all combustibles and possible ignition sources during routine and non-routine operations.*

## Final Safety Analysis Report

The committee was specifically requested to review the Final Safety Analysis Report (FSAR) and did so through extensive and detailed examinations by members, staff and consultants. Also considered were the results of reviews by other organizations (EH&S, EEG, etc.). These examinations identified a large number of specific concerns and weaknesses in the FSAR. These problems included (1) missing or incomplete commitments necessary to envelop safety criteria, (2) inconsistent information between FSAR sections, (3) questionable operational safety requirements, (4) lack of differentiation between descriptive matter and commitments, and (5) unacceptable application of certain quality assurance (QA) program requirements. These specific issues were discussed with WIPP management personnel in the DOE and Westinghouse organizations.

Subsequent reviews of actual practices being implemented showed that a majority of these concerns were either due to omissions or were editorial in nature, the likely result of lack of understanding of the management philosophy for the FSAR discussed above or inattention to detail by internal reviewers.

The fundamental issue with the FSAR concerns its basic purpose, its content and how it is handled, both in terms of initial approval and future approval of changes. Applicable DOE Orders, both at the Headquarters and field office levels, are not precise on this matter. To address this issue, committee members interviewed senior DOE managers that control WIPP policy, including the Headquarters program managers in the Office of Defense Programs, oversight managers in the Office of Environment, Safety and Health, the manager of the Albuquerque Field Office, and the manager of the WIPP Project Office. All of these managers agreed that the FSAR was intended to be the top level safety document for WIPP that would contain all of those commitments necessary to envelop the safety analysis to insure the safe operation of WIPP throughout its life. They further agreed that the FSAR is a living document that would be approved at a senior level of management and be maintained up-to-date, and, that future changes would be handled in the same manner as the original approval. The committee strongly supports the position of your managers and urges prompt revision to DOE policies to clarify FSAR requirements and define it as the top level commitments document.

Both DOE and Westinghouse WIPP managements have not been aggressive enough in promptly resolving issues raised in external reviews of the FSAR (and other areas) such as those raised by the Office of Environment, Safety and Health and the State of New Mexico Environmental Evaluation Group.

The committee believes that a thorough review and revision of the FSAR, based on updated DOE policies and on the various external reviews, is a key step to insure long term consistent application of commitments and eliminate deficiencies that could adversely affect long-term safe operation.

*Recommendations:*

*Revise applicable DOE policies and orders to define the FSAR as the top level safety document that will be:*

- *a compilation of all commitments necessary to ensure safe operation of the facility,*

- *approved at a senior level of management, and*

- *kept up-to-date as a living document with future changes handled in the same manner as the original approval.*

*Review and revise the WIPP FSAR based on the revised DOE policies and on existing critiques. Give priority to resolving all open issues.*

## Quality Assurance

As a result of initial reviews of policy documents such as the FSAR, the committee had serious reservations about the structure and adequacy of the quality assurance program. However, subsequent reviews of actual program practices showed that most of the concerns were unfounded and had resulted from poor descriptions and other inadequacies in the FSAR. The committee reviewed a number of different aspects of the actual WIPP quality assurance program being implemented and found it to contain most of the features one would expect at a more complex facility such as a reactor. WIPP has obtained quality assurance professionals with previous experience who understand both the technical and administrative aspects of a full featured quality assurance program. Previous DOE reviews have identified a number of quality assurance program deficiencies, most of which have been corrected.

The committee did observe several areas which require further management attention and corrective action. While some of these issues do not relate to the Quality Assurance Department, they are discussed below within the broader definition of the WIPP quality assurance program.

The committee considers that the General Criteria for Quality Assurance defined in the FSAR forms a sound basis for both the operation of the facility and for associated experimental activities. However, the application of the General Criteria is inconsistent between the operational and experimental activities and could degrade the overall performance of important experimental efforts.

Many organizations are involved in the resolution of outstanding safety related technical and procedural problems requisite to the start-up of WIPP. The committee was satisfied that most of these outstanding issues were identified on one or more of the work off schedules. However, the committee was concerned that there is no simple master tracking system to insure that relatively straightforward safety issues do not become "lost" or needlessly become the critical path. Further, lack of such a system deprives management of a tool to detect early adverse trends and imbalanced work loads.

Training programs have been initiated and a significant amount of training has been accomplished. However, the committee is concerned that too much emphasis has been placed on "self-study" to the detriment of formal presentations. In the commercial nuclear power industry, the use of self-paced study is very limited and is used in conjunction with evaluation methods to assure the intent of the self-study is realized. Also, it appeared to the committee that the training department does not have sufficient input to senior WIPP management to resolve training problems, particularly as the work pace increases and there is less time for ongoing training.

*Recommendation:*

> *WIPP management should complete open quality assurance related corrective actions, correct inconsistencies in the application of Quality Assurance General Criteria, consolidate and upgrade current tracking systems, and insure that Training Department management has access to senior management.*

## Organization and Management

The committee found that the DOE, Westinghouse, and Sandia National Laboratories have each established organizations that should be capable of performing WIPP operations in a safe and coordinated manner. This, of course, assumes that open issues in the areas of staffing and training are properly resolved. However, the committee has concerns regarding the lack of clear definition of certain reporting relationships that could result in confusion as to "who's in charge". In particular, the FSAR defines the Management and Operating Contractor (MOC) and the Scientific Advisor (Sandia) as holding equal levels of authority under the DOE WIPP Project Office Manager (WPO). This leads to the conclusion that the WPO manager will provide day-to-day line direction and coordination for facility operation. In actual practice, most of the hands-on experimental work in the facility will be carried out by an experimental division within the MOC organization. It appears to the committee that simple but important changes should be made to the FSAR to eliminate any confusion that the MOC is singularly responsible and accountable to the DOE for the safe and proper operation of WIPP.

Your recently announced policy is to establish a clear, straight line reporting relationship from operating facilities to the Headquarters program official and then to you. The current situation at WIPP appears to have two reporting chains to Headquarters. One of these runs from WIPP to the Operations Office to the Under Secretary while the other runs from WIPP to the Operations Office to the Assistant Secretary for Defense Programs (DP).

During the construction and testing phases of the WIPP project, many organizations have necessarily directed the development of various aspects of WIPP programs. Typically, the weight of influence changes among the Architect Engineer, the Constructor, the Laboratory and the Operating Contractor as the project develops. However, there comes a time on any major project when responsibility for "ownership" must shift to the MOC. That time is now for WIPP. The committee found several instances where the MOC has deferred to outside direction involving operating practices without first determining that such practices did not degrade safety.

The committee is very encouraged by the recent trend of improvements at WIPP which are the result of positive actions by DOE and Westinghouse managers and, in particular, their actions to bring qualified seasoned managers and staff onto the project. However, these trends are fragile and could reverse. The two most likely causes for a downturn would be failure to maintain very high standards in replacing managers and staff who leave through normal attrition and the departure of the best people for "greener pastures" unless clear, achievable goals are set and met for operating the WIPP facility.

*Recommendations:*

> *Redefine organizational responsibilities so that operational safety responsibility runs from a single operating contractor to the WIPP Project Office to a Headquarters Program senior official.*
>
> *DOE WIPP management should clearly indicate that Westinghouse has the responsibility to insure that all inputs relating to facility operations are properly reviewed for safety implications.*
>
> *In the event of attrition, high importance must be placed on proper replacements to insure the continuation of recent improving trends. Start-up plans need to consider the schedule effects on motivation, and thus retention, of the current DOE and MOC staff.*

## TRU Waste Certification

The committee's review shows that appropriate plans, procedures, and work practices appear to be in place for the certification of TRU wastes to be shipped to the WIPP site from both the Rocky Flats Plant and the Idaho National Engineering Laboratory. The techniques for the real-time x-ray radiography of drums were observed and appeared to be very effective, particularly for the detection of free liquids that might have accumulated in the drums. Procedures for the detection of loose surface contamination were sound. While the committee identified no safety significant concerns related to the waste certification program, there are several areas which should be strengthened to assure a high level of continued performance.

*Recommendations:*

> *Audits conducted by the WIPP-Waste Acceptance Criteria (WIPP-WAC) Committee should be more frequent than the now specified one*

*per year, particularly during the initial start-up phase. These should include unannounced audits and increased surveillance.*

*The WIPP - WAC should be reviewed in detail to insure full compliance with all applicable Department of Transportation (DOT) requirements.*

*The Department should review and standardize to the maximum extent possible the criteria applied to the numerous separate generator "sites" within the overall Rocky Flats complex and develop a systems approach to the preparation and shipment of TRU waste from the complex.*

*The variability of results from TRU waste content measuring techniques should be investigated and resolved to reduce the uncertainties that result from such differences.*

*There should be increased communication among generators, shippers, and the DOE and Westinghouse staff, especially on "lessons learned", consistent application of good practices, measurement techniques, and changes in waste forms.*

## Summary

The committee's review of the WIPP project focussed on short-term operational related issues and long-term performance of the repository. The operational issues are readily soluble and we have provided recommendations consistent with other comprehensive reviews, to address open safety questions.

Our review of the long-term performance issues has led to the primary recommendations we are making to the Department. The discussions presented above lead to the following major recommendations:

1. Perform an analysis of long-term performance relative to EPA Subpart B standards as a basis for initiating the experimental test phase (bin and alcove). The test phase would be conducted in compliance with 40 CFR Part 191 Subpart A after all other required permits/approvals have been obtained.
2. Emplace TRU waste for the experimental test program upon determining that there is reasonable confidence that WIPP can eventually be shown to meet release quantities and undisturbed site doses as required by EPA Subpart B, including a carefully considered intrusion scenario based on "reasonable projections". The basis for these projections should be explored with EPA as they apply to intrusion and distant time frames.
3. Continue performance assessment and experimental test programs, including study of the gas generation issue, and engineering enhancement studies to gain higher confidence in the expectation of achieving compliance with Subpart B. If the Department finds it necessary to use the EPA default values

in the performance assessment, it will need to consider use of engineering enhancements.

4. Upon determination that a high degree of confidence exists that EPA Subpart B requirements will be met, initiate the operational test phase as a graded emplacement program committed to deliberate steps to evaluate and work out operational issues identified in various reviews.
5. After formal documentation of compliance with Subpart B standards, implement the full program for long-term isolation of TRU waste.

Once these steps are taken for the operational and long-term issues addressed, we believe the WIPP will be a responsible repository for the disposal of TRU waste.

I would be pleased to discuss any of these issues further.

Sincerely,

John F. Ahearne
Chairman

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The **CHAIRMAN**. I must say, it seems to me artificially expensive to have to protect that against drill bits going through. I mean I just cannot imagine the scenario. I guess nuclear war and everybody is wiped out, and the human race regenerates itself, and they come along and then drill, thinking there is oil there or something.

That is so fanciful as to be absurd, it seems to me. I do not know, maybe not.

We are midway in a vote. And we will be back.

[Recess.]

Senator **BINGAMAN** [presiding]. The Chairman asked if I would go ahead and continue with the hearing until he returns.

Dr. Fairhurst, I understand you have not yet given your statement. Would you go ahead and summarize your testimony, please, and then we will have some additional questions for all of you.

## STATEMENT OF DR. CHARLES FAIRHURST, CHAIRMAN, PANEL ON THE WASTE ISOLATION PILOT PLANT, BOARD ON RADIOACTIVE WASTE MANAGEMENT, NATIONAL RESEARCH COUNCIL

Dr. **FAIRHURST**. Thank you very much, Mr. Chairman.

I understand that copies of the three most recent reports for the WIPP Panel were sent to your committee from the Academy several days ago.

Senator **BINGAMAN**. Could you pull the microphone up just a little closer, please? Thank you.

Dr. **FAIRHURST**. Certainly.

As these reports from the Academy indicate, the panel has been particularly concerned over the last two years with four specific technical issues relating to the isolation capability of the proposed repository at the WIPP site near Carlsbad.

These issues are room closure, that is, the underground excavations have been found to be closing approximately three times faster than predicted from laboratory test results.

Although this is a beneficial result, since it indicates earlier than anticipated sealing of the rooms, reasons for the discrepancy were investigated.

The second one was brine inflow. Observation of brine seepage into underground holes and rooms has led to the view that the salt formations, although at very low permeability, were saturated with brine, and the brine influence of the waste-filled repository could be appreciable.

The third issue was gas generation pressurization. Large quantities of gas could be produced in the waste-filled repository through the corrosion of the waste-filled drums, and bacterial decomposition of the waste from radiolysis.

Given the very low permeability of the salt and the intent to isolate each waste-filled room with impermeable seals, the gas may build up high pressures in the rooms. This may result in fracturing of the salts and the escape of radionuclides into the salt mass.

The fourth one is related to these concerns, the damaged rock zone. The rock around the periphery of the rooms tends to develop fractures, mostly small, but some large, that may allow escape of radionuclides around the repository seals.

These fractures may also heal in time, which is an important property of salt.

So those are some of the main issues in those reports.

Now, since the July 1989 report, our last one, considerable progress has been made towards explaining the differences between laboratory and full-scale results concerning room closure. A detailed study of brine inflow into a full-scale room is underway. And early results suggest that total inflow is likely to be very small.

The gas generation issue is currently a principal concern. Gas will continue to be generated for several hundreds of years after emplacement of the waste. And recent studies suggest that the low permeability of the intact salt will not allow the gas to leak away, and that pressures two to three times the pressure due to the overlying rock are theoretically possible.

On the other hand, the gas may leak through the damaged rock zone if this remains sufficiently permeable for a long enough period.

The WIPP panel has urged that alternative strategies for dealing with the gas generation issue be pursued vigorously.

DOE and its contractors have responded well to this issue and are investigating a variety of options, including possibilities such as addition of agents to reduce gas production, encapsulation of waste in cement, compaction, incineration, et cetera.

The Panel has urged the Department to give emphasis to the simpler of these engineered modifications of the waste, including perhaps keeping the repository under active engineered control for a considerable time after emplacement of waste.

The Panel also wishes to reemphasize the importance of an early start to the underground gas generation experiments. In our view, the optimum strategy for dealing with gas generation is now clear at this time.

Another more general issue is the one of performance assessment. Considerable effort is being made by DOE in assessing the likelihood that a WIPP repository would meet EPA release limits. That is, comply with 10 CFR part 191.

Results to date indicate a high probability the guidelines would be met for undisturbed conditions, but the compliance with the disturbed or human intrusion scenario would be the more difficult to achieve.

The WIPP Panel, although not having taken an official position on this, has some questions concerning the validity of the human intrusion scenario, and intend to address this as part of a special Board on Radioactive Waste Management symposium in Washington on May 23rd and 24th, 1990.

My final comment is that our recommendations made in the July 19th, 1989, WIPP report are still appropriate we feel. The response to these recommendations by DOE and its contractors has been very encouraging. And the WIPP Panel, overall, is optimistic that WIPP can be a very safe repository for transuranic waste.

Thank you very much. I will be happy to answer questions.

[The reports and recommendation referred to follow:]

# DOCUMENTS TO ACCOMPANY ORAL STATEMENT OF

DR. CHARLES FAIRHURST
CHAIRMAN

PANEL ON THE WASTE ISOLATION PILOT PLANT
Board on Radioactive Waste Management

National Academy of Sciences / National Research Council

Before the Committee
on
Energy and Natural Resources

U.S. Senate

Tuesday, 3 April 1990

July 19, 1989

# REVIEW COMMENTS ON DOE DOCUMENT DOE/WIPP 89-011: DRAFT PLAN FOR THE WASTE ISOLATION PILOT PLANT TEST PHASE: PERFORMANCE ASSESSMENT AND OPERATIONS DEMONSTRATION

## SUMMARY OF RECOMMENDATIONS

1. *DOE should develop and publish within the next six months a short, integrated, overall systematic assessment of long-term safety of the WIPP repository, as currently understood.*

2. *Urgent attention should be given to (i) defining the combined effects of gas generation, room closure and sealing, brine inflow, and other effects on the potential for long-term build-up of gases in the repository to lithostatic (i.e., overburden) pressure, with respect to the long-term isolation capability of the WIPP repository, and (ii) examining options for modifications to the waste as part of the resolution of the gas generation issue.*

3. *Given the urgent need to resolve questions concerning gas generation after emplacement of TRU waste, the Panel agrees that the bin-scale and room-scale experiments, involving approximately 0.5% by volume of the capacity of WIPP, are warranted and should begin without delay.*

4. *Data from laboratory tests (including tests at high ambient pressures), information from studies on gas generation from waste packages now stored at various sites, and information on experience abroad (e.g., U.K.) should be collected and studied, together with engineering modifications, as expeditiously as possible to assist in arriving at a sound, early solution to the gas generation issue.*

5. *The Department of Energy should include in the Plan a discussion of the risks associated with transportation of TRU waste to WIPP, relative to the transportation of other hazardous materials.*

6. *Demonstration of operational readiness should not start until several important issues concerning underground emplacement of waste for permanent isolation at WIPP have been resolved.*

## INTRODUCTION

Copies of DOE/WIPP 89-011 (full title: "Draft Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment and Operations Demonstration") were distributed in April to all members of the WIPP Panel for individual review. Topics for later discussion were selected by the Panel based on this review. The Panel assembled to consider the Draft on June 6-8 at the National Academy of Sciences (NAS) Green Building in Washington, DC. DOE staff and contractors made presentations and answered questions.

The Draft Plan (including the addendum dated June 16, 1989) proposes the underground emplacement of TRU waste equal to 2.7% by volume of the total design capacity of WIPP in the repository during the three-year period September 1989-September 1992 (Phase 1). This consists of 0.5% to be emplaced for experimental purposes and 2.2% for Operations Demonstration purposes. At the end of the three-year period DOE proposes to

> institute a holdpoint to analyze the results of the Performance Assessment and Operations Demonstration Programs up to that point. If, after a formal review of the results of the programs, there is reasonable confidence that WIPP will comply with the EPA Standard, 40 CFR 191, Sections 13 and 15 (as amended), and that Operations with actual TRU waste have been successfully performed in a safe and effective manner, a second part of the Test Phase will be undertaken. Test Phase activities and waste quantities for this part of the program

would be determined based on needs and requirements identified during the holdpoint review [DOE addendum (June 16, 1989)].

Several relevant documents (listed in Appendix A) were provided between the time of delivery of the Draft Plan and the WIPP Panel meeting; others were distributed at the meeting. These documents, together with the presentations and discussions during the June 6-8, 1989 meeting, yielded substantial information and insight on the proposed 5-year (Draft) Plan. Many of the conclusions and recommendations in the Panel's letter report are based on this more complete appreciation of the Plan.

## PANEL FINDINGS

The Plan contains two principal sections, one entitled Performance Assessment, the other Operations Demonstration. The two sections will be discussed separately. The conclusions and recommendations are presented in *italics*; associated discussions are presented in standard type immediately following the particular conclusion or recommendation.

## PERFORMANCE ASSESSMENT

### Conclusions

*Although the Plan is valuable in that it provides, for the first time, a comprehensive directory of all of the investigations, current or planned, under the WIPP program, and clearly indicates how these are related to the overall performance assessment activity, there are serious deficiencies in this Draft. In its present form, the Plan does not*

*(i) develop research priorities or identify critical problems;*
*(ii) identify or make appropriate use of the essential logic and rationale underlying the performance assessment process, i.e., the iterative, evolutionary selection and pursuit of investigations designed to establish the overall suitability of the WIPP site as a repository for safe, long-term isolation of TRU radioactive waste.*

Failure to describe the iterative reassessment process and how it has been, and is being used at WIPP is a serious omission, since the entire program of experimental studies now underway, and many of those planned, have presumably been decided on this basis. From presentations made at this and other meetings of the NAS/NAE/NRC WIPP Panel it is clear that DOE and its contractors have, in fact, followed a process, albeit less well-defined and more intuitive than the formalized performance assessment system now under development.

Notably absent from the investigations described in the Plan is any consideration of the influences of radionuclide solubilities or engineered modifications on repository isolation performance. Although no details were provided, DOE and its contractors stressed, during the meeting, that engineered modifications are now being given serious attention as contributors to overall isolation performance. The Panel has long advocated consideration of the merits of engineered modifications to improve the waste isolation performance of the WIPP repository, if improvements should indeed be necessary.

*While the performance assessment methodology described in Chapter 2.4, and illustrated graphically in Figure 2.4 (p. 2-21) of the Plan, seems to be appropriate for the formal assessment of compliance with 40 CFR 191, Sub-Part B (EPA Standard), it is unlikely that this methodology will have a substantial impact on the experiments planned, at least during the early part of the five-year Plan. It is also unlikely that the results of the experiments will be available for, or have any significant impact on, the performance assessment.*

Recommendation 1

*DOE should develop and publish within the next six months a short, integrated, overall systematic assessment of the long-term safety of the WIPP repository, as currently understood.*

The immediate purposes of such an assessment would be to

(i) identify critical risks and issues
(ii) articulate and document the rationale for currently proposed programs
(iii) establish priorities for these programs with respect to their expected contributions to the safe-repository objective (see Appendix)
(iv) stimulate early development of the iterative process of performance assessment priorities that is missing in the compliance-oriented "total system modeling" approach now being pursued (see Appendix).

The proposed assessment procedure would also complement the current performance assessment activities in the manner suggested by the Environmental Protection Agency (EPA) viz. in Appendix B, "Guidance for Implementation of Sub-Part B" [of 40 CFR Part 191] (Sept. 19, 1985).

> In making these various predictions [of overall disposal system performance] it will be appropriate for the implementing agencies to make use of rather complex computational models, analytical theories, and prevalent expert judgment relevant to the numerical predictions. Substantial uncertainties are likely to be encountered in making these predictions. In fact, sole reliance on these numerical predictions to determine compliance may not be appropriate; the implementing agencies may choose to supplement such predictions with qualitative judgments as well. (Emphasis added.)

Additional discussion of Recommendation 1 is presented in the Appendix B to this report.

Recommendation 2

*Urgent attention should be given to (i) defining the combined effects of gas generation, room closure and sealing, brine inflow, and other effects on the potential for long-term build-up of gases in the repository to lithostatic (i.e., overburden) pressure, with respect to the long-term isolation capability of the WIPP repository, and (ii) examining options for modifications to the waste as part of the resolution of the gas generation issue.*

Considerable attention was given, during the meeting, to the suggestion in the Plan that the combined long-term effects of repository closure and gas generation due to corrosion of the waste package, and bacteriological and radiological decomposition of the TRU waste, could result in the development of gas pressures of the order of the lithostatic (i.e. overburden) pressure in the sealed repositories. Such pressures could give rise to potentially serious effects such as the generation of radial fractures, originating from the repository and able to propagate away from the repository, thereby allowing transport of radionuclides outside the repository. Computations suggest that the *intact* salt formations are likely to be essentially impermeable to gases; hence pressure leak-off may not occur.

On the other hand, it is possible that salt permeability may increase due to micro-fracturing caused by gas pressures (acting within the underground cavity) as they approach lithostatic pressure. This needs to be examined. Also, recent studies have revealed the development of circumferential fractures in the immediate vicinity of the underground excavations (the so-called "disturbed rock zone"). These fractures develop progressively as the excavations close, and may serve as high permeability paths along the periphery of the excavations. These paths would allow the gas to escape from the storage excavations as it is generated, at least until the fractures reheal due to creep closure around repository seals.

Studies have been started to examine the combined effects of gas generation, disturbed-rock-zone development, and engineered (chemical) modifications to the waste package on gas generation, long-term, in the overall repository environment. Laboratory, and perhaps in-situ, tests, even at a small-scale, to determine the gas permeability of intact salt as the pressure inside a "sealed" cavity approaches lithostatic pressure, would be very informative with regard to this problem.

Because the time necessary for gas pressure build-up to occur is considerably longer than the five-year period of the proposed DOE Plan, it is important that efforts be undertaken now that can reduce or eliminate concern that gas generation will affect safety. Such measures include changes in container materials, waste modification, and engineering modifications.

## Underground Experiments

### Conclusion

*Determination of the rate, quantity, and composition of gases generated by the very heterogeneous mixtures of existing TRU wastes will require both laboratory (bench) and large-scale experiments, the latter involving assemblies of drums of TRU waste.*

### Recommendation 3

*Given the urgent need to resolve questions concerning gas generation after emplacement of TRU waste, the Panel agrees that the bin-scale and room-scale experiments, involving approximately 0.5% by volume of the capacity of WIPP, are warranted and should begin without delay.*

### Conclusion

*Underground test results alone will not suffice for an early decision on appropriate strategies for addressing gas generation in waste package and underground emplacement, since much of the important data will still be accumulating at the end of the currently scheduled test phase (i.e., September 1991).*

### Recommendation 4

*Data from laboratory tests (including tests at high ambient pressures), information from studies on gas generation from waste packages now stored at various sites, and information on experience abroad (e.g., U.K.) should be collected and studied together with engineering modifications as expeditiously as possible to assist in arriving at a sound, early solution to the gas generation issue.*

The gases generated by the emplaced waste will be so low in radioactivity as to be considered non-radioactive. The processes by which gases are generated under repository conditions, including corrosion and radiolysis, do not produce radioactive isotopes. The repository gases should include only trace amounts of the noble gas fission products released from the wastes.

## OPERATIONS DEMONSTRATION

Panel discussion of the need for demonstrating the ability of the WIPP facility to "be safely and effectively operated as intended by Congress in PL 96-164" [DOE statement of purpose of operations demonstration], was divided into two main topics:

1. Transportation and associated emergency preparedness issues (accident prevention, states training and education)
2. The need for early demonstration of operational readiness and pre-operational testing, including underground emplacement of TRU waste.

## Transportation and Emergency Preparedness

### Conclusion

*The system proposed for transportation of TRU waste to WIPP is safer than that employed for any other hazardous material in the United States today and will reduce risk to very low levels.*

The Panel was impressed with the WIPP program activities in transportation of TRU waste and emergency preparedness. The program is both very comprehensive and thorough, and will undoubtedly result in low levels of risk associated with surface transfer of TRU waste from current storage locations to the WIPP facility.

### Recommendation 5

*The Department of Energy should include in the Plan a discussion of the risks associated with transportation of TRU waste to WIPP, relative to the transportation of other hazardous materials.*

Panel members expressed concern that there was no indication, in either the Plan or the oral presentations, of a relationship between (a) the assessment of risk and safety associated with the various aspects of transportation of TRU waste and (b) the emergency planning and education program. Also, the 'high profile' and comprehensiveness of the states training and education program may give a false impression that TRU waste is more hazardous than a variety of other hazardous materials, some posing a significantly greater risk, that are routinely handled in the same states and on the same highways with no special precautions. In the Panel's view, the Department is being exemplary and responsible in giving a high level of attention to TRU waste transport. Such attention is appropriate for shipment of all hazardous materials, almost all of which pose greater risk than the TRU shipments.

## Demonstration of Operational Readiness

### Conclusions

*Demonstration of operational readiness is an important phase of the overall WIPP program.*

Pilot-plant and prototype testing are essential scale-up steps in the sound development of new technological systems. Given also the unique nature of the WIPP facility, such operations demonstration activities become particularly important. Transportation and underground emplacement of TRU waste on a pilot-scale are necessary parts of the overall demonstration that the WIPP facility can be operated safely for TRU waste isolation.

*The overall public health consequences of the proposed operations demonstration are likely to be very small, given*

*(i) the low risks associated with transportation of TRU waste (discussed above), and*
*(ii) the inherently high security of the WIPP underground location, especially on a monitored storage basis, as is contemplated for the five years of the Plan.*

**Recommendation 6**

*Demonstration of operational readiness should not start until several important issues concerning underground emplacement of waste for permanent isolation at WIPP have been resolved.*

The Panel discussed the desirability of starting the operations demonstration activities at the same time as the underground experiments. It was noted that significant waste handling experience will be gained by emplacement of the waste for the gas generation experiments.

Although it was acknowledged that early experience with operational activities (i) would expose, in a timely manner, problem areas that are manifested only in integrated plant operations, and (ii) could provide needed guidance on realistic alternatives between longer-term engineered isolation and permanent isolation options, there are important unresolved issues that could significantly affect the method of packaging and emplacement of TRU waste underground at WIPP.

These issues include, for example, (i) appropriate method(s) of dealing with gases generated from the waste containers stored underground; (ii) appropriate back-fill composition and back-filling procedures that may be considered necessary; and (iii) other engineering modifications that may prove necessary for the safe isolation of TRU waste.

DOE is, in fact, not yet ready or able to undertake a demonstration of operations as they will be conducted during waste emplacement for long-term isolation. As a consequence, the Panel does not consider in any detail the DOE proposed plans for operations demonstration.

## APPENDIX A

## DOCUMENTS DISTRIBUTED TO WIPP PANEL TO SUPPLEMENT DOE DRAFT PLAN (DOE/WIPP 89-011)

- Draft Supplement Environmental Impact Statement, Waste Isolation Pilot Plant (2 vols) April 1989. DOE/EIS-0026-DS.
- Plan for the Disposal System Characterization and Long-Term Performance Evaluation for the Waste Pilot Plant SAND 89-0178 (by S.G. Bertram-Howery and R.L. Hunter) 1989.
- Systems Analysis, Long-Term Radionuclide Transport, and Dose Assessment, Waste Isolation Pilot Project. (A. R. Lappin and R. L. Hunter, Editors); SAND 89-0462 April 1989.
- Draft Test Plan - WIPP Bin-Scale CH TRU Waste Tests TP-BIN1 5/8/89 (by Martin A. Molecke) May 1989.
- Test Plan - WIPP In-Situ Room-Scale CH TRU Waste Tests TPROOM1 6/05/89 (by Martin A. Molecke) June 1989.

No details were provided on plans for proposed laboratory experiments on gas generation. These are an essential complement to the proposed bin- and room-scale experiments. Details of the laboratory experiments would have allowed a more complete review of the bin- and room-scale tests. Also, the documents TP-BIN1 and TPROOM1 were distributed at the meeting in provisional, unreviewed draft form. Hence the primary source of information on the Bin- and Room-scale tests was the oral presentation by Dr. Molecke, and the Panel's conclusions were based on this presentation.

## APPENDIX B

## ADDITIONAL COMMENTS ON THE DEVELOPMENT OF COMPLEMENTARY APPROACHES TO PERFORMANCE ASSESSMENT

It is clear from reading 40 CFR 191 that EPA, in setting the Standard, recognized the difficulty of making precise quantitative predictions of the radionuclide releases from a given geological repository over periods of the order of 10,000 years or longer. In noting the merit of having "expert judgment" and "qualitative judgment" to assist in arriving at release estimates [See quotation in discussion of Recommendation 1, (Page 3)], EPA is acknowledging the uncharted and unprecedented nature of the computational task. The primary goal of 40 CFR 191 is to ensure that a repository poses no significant health risk to the public; the standards set for compliance represent EPA's best estimate of what is required to achieve this goal. To date, however, these standards have never been applied to a specific repository.

The Panel believes that the above-mentioned primary goal can best be achieved by focusing performance assessment activities on demonstrating that the WIPP repository will be *safe*, i.e, pose no significant risk to the public health and safety, rather than by an *uncritical*, formal adherence to compliance with the current EPA standard. The latter approach could result in neglect of possible long-term dangers or, conversely, unnecessarily detailed analyses of issues that can readily be shown to be of negligible consequence on simple qualitative grounds.

Clearly, it will be necessary to show compliance with the 40 CFR 191; and it is probable that the *"safe repository"* approach will lead to a design that is in compliance with the EPA standard. It is also probable that the experience gained by following this approach in the WIPP performance assessment process could lead to the identification of shortcomings in the present repository standards.

The recommended approach would be complementary to the present performance assessment effort, and it is anticipated that the initial effort of identifying critical issues and risks could be performed over a period of several days only. Division of the scenarios according to time periods (e.g., 10 yrs, 100 yrs, 1,000 yrs, 10,000 yrs) could illuminate the issues and risk management options. The scenarios are defined by (a) an initiating event (e.g., containment failure, gas generation, and fluid invasion); (b) undesirable consequences (e.g., fatalities and radionuclide release); (c) specific events that map (a) to (b). This approach forces an integration of the whole system and identification of the manner in which all components (hardware, procedures, software, and people) interact. The desired result is an *early* identification of the top several scenarios that currently appear most important on a risk basis. Simple bounding models, such as envisaged for this assessment, may well suffice to demonstrate acceptably low risk. Such models also have the advantage of being more comprehensible to the layperson than the complex models being developed for 40 CFR 191 Sub-Part B compliance purposes.

## WIPP Panel Members

Charles Fairhurst, Chairman, University of Minnesota (rock mechanics)
John O. Blomeke (engineering, civilian waste program)
John D. Bredehoeft, U.S. Geological Survey (hydrology)
Karl P. Cohen, consultant (nuclear science, technology)
Fred M. Ernsberger (materials science)
Rodney C. Ewing, University of New Mexico (local, regional geology)
D'Ar[illegible] A. Shock, consultant (mining engineering)

## Board on Radioactive Waste Management
## Members Attending June 6-8, 1989 Meeting

George M. Hornberger, University of Virginia (hydrology, environmental sciences)
Christopher G. Whipple, Electrical Power Research Institute (risk analysis, energy economics)

## Paid Consultants Attending
## June 6-8, 1989 Meeting

B. John Garrick, Garrick, Pickard and Lowe (risk assessment)
Sherwood Chu, MRS Commission (transportation)

## COMMISSION ON PHYSICAL SCIENCES, MATHEMATICS, AND RESOURCES

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Glenn Paulson, Center for Hazardous Waste Management (waste management out of plant/hazardous waste engineering)
Eva L. J. Rosinger, Atomic Energy of Canada, Limited (nuclear engineering)
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Susan D. Wiltshire, JK Associates (mathematics, public policy)

NATIONAL RESEARCH COUNCIL
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BOARD ON
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December 30, 1988

Mr. Critz George
U.S. Department of Energy
Office of Defense Waste
and Transportation Management
DP-124/Forrestal
Washington, DC 20545

Dear Mr. George:

The Waste Isolation Pilot Plant (WIPP) Panel of the Board on Radioactive Waste Management (BRWM) has reviewed the data on room closure rates from laboratory tests and in-situ experiments. What follows is a suggested design for an intermediate-scale experiment to better define the sources of the discrepancy between the predicted and observed salt creep rates, as requested by the Department of Energy.

Summary

Measurements in underground test rooms [of the order of 5.5m (wide) x 5.5m (high) in cross-section] at the WIPP site indicate room closure rates three to six times greater than the rate predicted by numerical computational codes used to model the deformational behavior of the rooms and associated pillars. The codes incorporate mechanical properties for the salt around the rooms identical to the properties derived from deformation behavior observed in laboratory creep tests on small (i.e., of the order of 50mm diameter x 100mm high) core samples taken from the WIPP site.

It is important to establish the reasons for this discrepancy in order to assess better the extent to which such codes can be used to predict quantitatively the field performance of repository excavations in salt.

For this purpose, a limited number (two to five) of in-situ tests are recommended to observe closure rates around horizontal, circular excavations intermediate in scale (i.e., one meter or so in diameter) between the above mentioned field and laboratory tests. Such tests, by providing a "third set" of independent data, will assist in identifying likely and unlikely causes of the observed discrepancies.

*The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering to serve government and other organizations.*

## Discussion

Evaporite rocks such as the salt formations at the WIPP site exhibit time dependent deformational behavior when subjected to load. The deformation is related in a complex, non-linear way to the applied stress, temperature, time--and possibly to other variables. Lomenick, McClain and Starfield, for example, used an empirical relationship of the form:

$$E_t = E_o + A\sigma^a T^b t^c \qquad (1)$$

where $E_t$ is the strain of the material at any time t

$E_o$ is the instantaneous (or "elastic") strain that develops immediately upon load application--and is recovered immediately upon unloading

$\sigma$ is the applied stress (some function of the three-dimensional stress rate)

T is the absolute temperature ($^oK$)

t is time

A,a,b,c are constants

to analyze deformations around underground openings as part of Project Salt Vault studies at Oak Ridge National Laboratories ["a" for example, was found to be approximately 3, i.e., strain (and strain rate, convergence, and convergence rate) was proportional to the cube of the stress]. The empirical power law was found to provide good agreement with observed behavior for periods of the order of weeks to months.

Sandia staff, as part of their research to predict deformation behavior with good accuracy over the period of the repository loading operations, i.e., of the order of 50 years, have attempted to develop an expression for creep behavior that directly incorporates fundamental creep processes that are operative within the internal structure of the salt. The expression is more complicated than equation (1) above, with a greater number of variables, whose magnitude is determined from analysis of the laboratory test data. Incorporation of the expression into the numerical codes allows modeling of the excavations and prediction of the convergence and convergence rates for the excavations.

Finding that the observed rates of room closure are three to six times larger than those predicted from the laboratory results, Sandia explains the difference by:

(i) refining the creep expression (or "constitutive relationship") to incorporate additional fundamental mechanisms; or

(ii) attempting to assess whether strains occurring during the very early times after the theoretically "instantaneous" (but practically finite duration) load applications are properly taken into account in the measured deformations; or

(iii) speculating that the process of coring and removing samples from the in-situ environment and preparing specimens for laboratory testing significantly changes the observed deformational response to load.

Sandia staff have also noted that an empirical reduction of the in-situ modulus of elasticity of the salt mass by an order of magnitude (factor of 12.5) compared to the laboratory measured value will bring laboratory and field results into quite close correspondence for the periods of field observation used. Although no specific justification is given for this reduction, it is well known that a rock mass may contain cracks and fissures too large to be included in a small test specimen. These cracks can reduce the stiffness (or modulus) of the rock mass compared to small specimens--by as much as a factor of one hundred or so at low stress levels, i.e., when cracks are open and compliant.

With the exception perhaps of the modulus reduction approach, the above explanations of the discrepancy suggest a belief that the laboratory test procedures and results, properly interpreted, are capable of explaining the field observations, i.e., that the "errors of interpretation" lie fully with the laboratory tests. While this may be true, it is also certainly plausible that there may be influences in the field scale tests that are absent (or at least different in degree) in the laboratory situation.

The most obvious of these influences are:

1. Scale. The volume of rock undergoing deformation in the field is very much larger than in the laboratory.

Although the strength of some rock types is known to decrease with an increase in the loaded volume (due to the greater possibility of large, weakening flaws in the larger volume), evaporites are often considered to be less subject to size effects than other rock types. Flaws in evaporites tend to heal with time.

2. Geometry. The laboratory tests are conducted on small (initially unloaded) cylindrical specimens; an axial load is applied to the specimen by a testing machine. The field tests involve rectangular openings in an essentially infinite medium, which deform as a result of the redistribution of preexisting (overburden and lateral) loads.

It is known from laboratory tests that the compressive strength of a hydrostatically compressed specimen in the form of a hollow thick-walled cylinder is several times greater than the strength of a standard solid (cylindrical) test specimen. Thus, geometry does influence strength--although apparently not in a way that would explain the observations at WIPP, where salt around the large rectangular holes is apparently weaker (i.e., creeps more rapidly) than salt in the small, solid cylindrical test specimens.

Tests have been conducted to determine the in-situ state of stress at the repository horizon, to see whether orientation of stress might help to explain the discrepancy between field and laboratory data. Results tend to confirm the expected condition that the principal stresses are all approximately equal to the overburden stress (i.e., "lithostatic"). In addition, although there is some variation with direction in the observed rates of closure of the excavations, this variation is of the order of ±25% of the mean of all observed rates, and hence much less than the 300% (or more) difference between field results and the predictions from laboratory results. Nor can the difference be ascribed to computational error: the numerical code SANCHO used to predict the field results has been "benchmarked" (i.e., shown to give results consistent with other numerical codes and with analytical solutions).

It would appear that in the specific situation of the WIPP site, there are a number of possibilities for explaining the observed discrepancy, in addition to the general scale and geometry effects, and those noted in (i), (ii), and (iii), above. For example:

1. The three-dimensional stress distributions imposed by the size and cylindrical geometry of the laboratory specimens and the testing machine (relatively rigid steel loading) may effectively inhibit deformation compared to the field loading situation, where the loads are applied naturally, i.e., without a mechanical interface.

2. Structural features within the "significantly affected region" around the excavation may contribute to the development of deformation mechanisms that are (a) not possible in the smaller, "effectively more confined" specimens, and (b) not incorporated in the numerical models. Buckling of "slender beams" resulting from sedimentary interfaces close to the wide excavations (i.e., Marker Bed 39 and roof shearing in other areas), and perhaps incipient buckling associated with cracks and fissures in the vicinity of the excavation, are all examples of possibilities for mechanisms that will not be seen in laboratory tests on small specimens.

With only two situations available for comparison, i.e., the small-scale laboratory and the large-scale in-situ case, it will be very difficult to:

a. identify whether or not the differences in scale, geometry, and loading conditions of the two situations introduce, eliminate, or modify mechanisms and causes for deformation in one case compared to the other, and

b. counter assertions that agreement between predictions based on laboratory tests and observed field results is a consequence of "curve fitting" (i.e., selecting arbitrary values of disposable variables in the constitutive relationship so as to optimize agreement with observations).

The possible effect of differences in scale and geometry could be investigated by an intermediate-scale experiment. The availability at WIPP of special equipment for drilling 36-in.-diameter horizontal holes into the salt would make such an experiment feasible, providing an opportunity both to assess specific mechanical properties (e.g., the in-situ modulus of elasticity of salt around the excavation), and to assess the effects of scale and geometry on the rate of closure of excavations in the salt. Observations on closure around a 36-in.-diameter hole would provide data on a scale intermediate between the current two situations (laboratory-scale and full-scale) and for a geometry that more closely resembles the full-scale excavation than the laboratory tests. It would also be possible to instrument the region adjacent to the (proposed) hole before it is drilled, thereby allowing determination of in-situ deformation behavior and its variation with time from the instant that the large hole is drilled.

Recommendation

Given that equipment is available underground at WIPP for drilling large diameter (one meter or so) boreholes into the salt, it seems feasible to undertake tests to observe time dependent deformations around such holes and to compare those predicted by the numerical model. The possibility of such tests has been explored with Sandia staff in discussions and visits to a possible site underground.

Figure 1 shows the site and test layout recommended on the basis of the discussions. In essence, a 36-in.-diameter, 100-ft.-long borehole would be drilled between two drifts in a 9-ft.-thick layer of uniform ("clean") salt at an elevation midway between two anhydrite layers. At this spacing the influence of the anhydrite layers on the deformation behavior of the borehole should be negligible. Installation of stress change and deformation gauges in the vicinity of the 36-in.-hole prior to coring should allow observation of all deformation, including the "early-time" deformation, resulting from drilling the hole. This early deformation was not observed in the full-scale tests.

Such a test has the following additional attributes that should help reduce the present uncertainties:

1. The salt being studied is not removed from its natural environment--as are the laboratory test specimens.

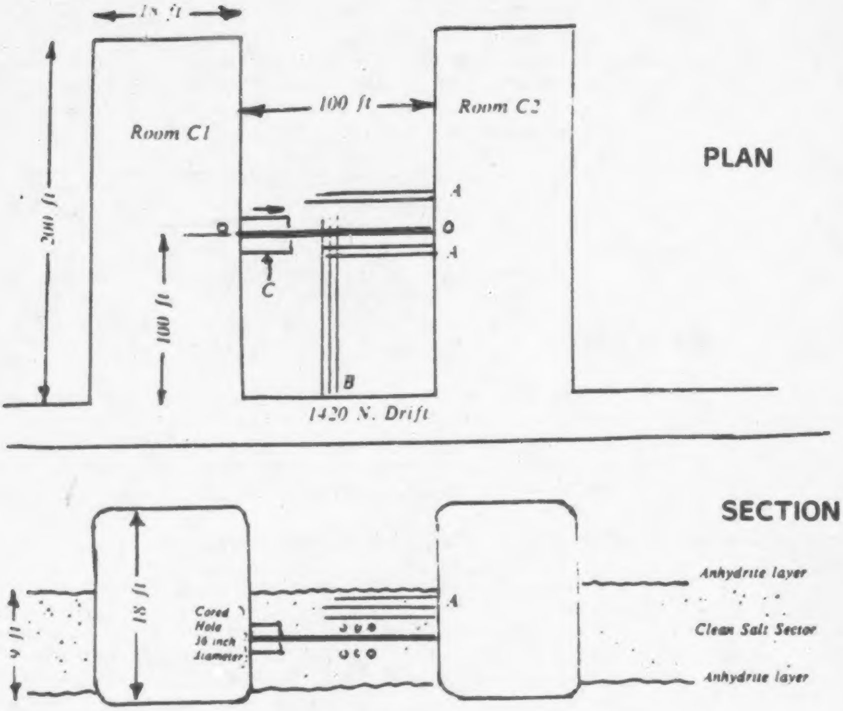
18 ft
Room C1
100 ft
Room C2
PLAN
A
O
O
A
C
200 ft
100 ft
B
1420 N. Drift
SECTION
18 ft
9 ft
Cored Hole 36 inch diameter
A
Anhydrite layer
Clean Salt Sector
Anhydrite layer

**FIG 1. Recommended Layout of Intermediate Scale Time-Dependent Deformation Test**

Test Procedure

Phase 1. (a) Drill one or more small diameter (2 to 3 inch) holes O-O horizontally between the two rooms. Instrument - to observe early deformations ahead of large coring drill as hole is being cored

(b) Drill three dimensional array of horizontal holes (A, B) at various heights [around path of (future) 36 inch hole] from Room C2 and 1420 N Drift, to observe stress changes and deformations induced in the vicinity of the large hole C as it is being drilled

Phase 2. Drill 36 inch diameter hole C horizontally from room C1 to room C2. Instrument to observe time dependent radial deformation imposed on the borehole. This deformation rate will be different at various cross sections due to the variation in stress concentrating effects of Rooms C1, C2,--hence several loading conditions can be simulated

2. There is no mechanical interface in the loading system.

3. The test is approximately one order of magnitude smaller in scale than the room excavation tests and one order of magnitude larger than the laboratory tests--so that it will allow evaluation of scale effects.

4. The test geometry is somewhat similar to that of the room excavation (long uniform cross-section) and the overburden pressure is comparable so that the three-dimensional stress conditions are reasonably similar. In both cases (room and borehole), the test scales are much larger than the salt grain size--so that scale effects due to the salt structure itself should be the same in the two cases. Salt structure scale effects may be significant in the laboratory test.

5. Anhydrite and clay seams occur within the region of stress redistribution around the full-size excavation. At the site recommended for the intermediate-scale experiment, the possibility of such influences on the time-dependent deformation around the hole is very much reduced.

Some Possible Outcomes of an Intermediate-Scale Experiment

- If the field/laboratory comparison for the intermediate-scale experiment proves to be essentially the same as for the full-scale tests (i.e., actual deformations 300% or so greater than numerical model predictions), then the differences are probably not the result of the volume of salt under high (deviatoric) stress, but more likely the result of the basic differences between laboratory and field testing procedures. The influence of differences in geometry between the cylindrical specimen tests and the field tests could be assessed by performing laboratory tests of radial creep behavior in thick hollow cylinders (e.g., 2-in. internal diameter, 10- to 12-in. outside diameter) subjected to external hydrostatic loading--this geometry would closely approximate that of the intermediate-scale test.

- If the intermediate-scale test results fall between those of the laboratory and field results, then it would appear that some form of scale effect is operative. This would indicate that more detailed laboratory studies of creep of uniaxially loaded solid cylinders will not suffice to explain the observed differences between field and laboratory behaviors. (The hollow cylinder laboratory tests mentioned above would help separate the influences of geometry and size on the result.)

- If the intermediate-scale results fall outside the range of the laboratory and full-scale results, it would again be important to assess the significance of test geometry (i.e., conducting laboratory hollow cylinder tests to allow comparison between tests of essentially similar geometries for the three existing series of tests). If the intermediate-scale results are still outside the range of the other tests, this would strongly suggest that removal of the salt from the original environment and preparation of test specimens significantly change the creep response. This would indicate that current understanding of the processes of creep in salt (and especially in laboratory specimens of salt) is inadequate to allow reliable prediction of the rate of closure of full-scale excavations from observations on laboratory specimens. In the case of the WIPP repository, this would imply that predictions of long- term excavation closures must rely on in-situ observations. The finding would also have considerable general implications, e.g., for cases where borehole cores only are available for testing (i.e., during site exploration, before direct underground access and testing are possible).

Thus, although of course results of the intermediate-scale tests cannot be anticipated, the tests do have the potential for providing important insights into the causes of the observed discrepancies between model predictions based on the laboratory tests and full-scale field observations.

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Chairman, Panel on the
Waste Isolation Pilot Plant Project

MAR 3 1988

# Report on Brine Accumulation in the WIPP Facility

## Background

The Waste Isolation Pilot Plant (WIPP) facility, a proposed repository for transuranic radioactive waste, is being constructed in a thick bed of salt 650 m (2150 ft) under the surface in southeastern New Mexico. When the repository has been filled with waste and sealed, the salt is expected to move by plastic flow into repository openings and ultimately to lock the waste in a solid mass of crystalline salt. In this manner the waste would have minimal contact with moving groundwater, because no appreciable continuous flow of water is possible through the nearly impermeable structure of an undisturbed salt bed. It has been known for a long time, however, that the salt does contain some water (averaging about 0.5 percent), in the form of brine both within and between the salt crystals. The presence of water at WIPP is shown by efflorescences that appear on walls of rooms and tunnels, by salt icicles that form where brine drips from the ceiling, and by the brine that collects in some of the holes drilled into the floor. The amount of brine is small, so that the workings are kept dry by normal ventilation procedures and will remain dry as long as the repository is open. When the repository has been sealed after filling with waste, however, brine is expected to accumulate slowly in repository openings. The amount of this accumulation is uncertain, and different estimates of the amount have recently aroused controversy.

Scientists at the Sandia National Laboratories (SNL), the technical consulting agency for DOE, maintain that the amount of brine accumulation is small, and calculations indicate that it will be absorbed by the backfill material to be placed in the rooms and tunnels. Thus no interference is expected on the basis of preliminary observations with the plastic flow of salt into disposal rooms and around the waste packages. A contrary view* has been expressed recently by a local group of scientists, most of them from the University of New Mexico (the Scientists Review Panel: SRP), who suggest that the amount of accumulation may be large enough to entrain both backfill and waste in a mobile radioactive "slurry." Such a fluid would prevent consolidation of the salt and might move to the surface to release radioactive material in quantities exceeding EPA standards. Because of this concern, SRP recommends a hold on repository construction and on DOE's plan to start bringing large numbers of waste drums to the site in October 1988 for a projected five-year pilot phase of the repository operation. Scientists in the State of New Mexico's Environmental Evaluation Group (EEG), while not advocating a halt on repository excavation or on experimental work with radioactive waste in the repository tunnels, also feel that uncertainty regarding the quantity of brine is sufficient to warrant serious study before large numbers of waste drums are placed underground.

The National Academy of Sciences, through its Board on Radioactive Waste Management and its WIPP Panel, has been asked to express an opinion as to how well existing data resolve these conflicting viewpoints. In response to this request, the Panel has reviewed pertinent documents and convened a special meeting in Albuquerque (18-19 February 1988) at which scientists from SRP, SNL, and EEG presented their views. The Panel was assisted in its review by several members of the Board and three invited consultants. This report is a record of the augmented Panel's conclusions.

## Statement of the Problem

The essential issue is one of balance between several rates, principally: (1) the rate at which brine seeps into repository openings from the salt; (2) the rate at which the openings are closed by plastic flow of the salt; and (3) the rate at which gases are generated in the drums and dissipated. If the first rate is slow enough, the plastic creep can be expected ultimately to immobilize the waste in solid salt; this is the goal of SNL's repository design. If brine inflow and gas generation are too fast, complete consolidation of the salt would be prevented, and mobile fluids (liquid plus gas and entrained solids) would collect in the remaining open spaces of the waste-filled rooms; this is the result feared by SRP and recommended for further study by EEG. The issue of balance has been recognized for a long time, but because all three rates are known only over such broad ranges of measured values, complete resolution has not been possible.

(1) The rate of brine inflow depends chiefly on the permeability of the salt and the difference in pressure acting on brine within the salt and in the repository openings. Permeability measurements have been attempted in many ways, all of which give ranges of values—hardly surprising, since salt beds vary in composition and structure from place to place. Measured values lie predominantly in a narrow range of very low permeability ($10^{-8}$ to $10^{-9}$ darcy), but locally the values are somewhat higher and a very few are several orders of magnitude larger still. Visual observations of tunnel walls (both during previous visits by the Panel to the WIPP site and as shown on numerous photographs displayed by SNL) indicate that areas of higher permeability occur in discrete zones of limited extent. In estimating rates of brine inflow, SNL uses permeability values at the high end of the in-situ measured range. The larger values used by SRP were from drill stem boreholes made by oil exploration companies, and these tests are not considered as reliable as those made for the express purpose of determining permeability at the emplacement horizon.

The initial difference in pressure between the salt and open disposal rooms can be specified in a narrower range, as somewhere between the hydrostatic and lithostatic pressure in salt at a depth of 650 m (2150 ft) [roughly between 70 and 140 bars (1000 and 2000 psi), respectively]. The pressure difference will decrease markedly at the very end of the period of salt consolidation (and brine inflow will be correspondingly smaller), because any fluid that exists in repository voids will be tightly squeezed.

(2) The rate of closure of the WIPP excavations due to salt movement has been monitored over the past several years. Results to date show that measured rates are substantially faster than initial theoretical predictions, and that complete closure can be expected in about 100 years. The rate of closure will decrease in the final stages because of resistance offered by the compacted waste, backfill, and any brine or gas that may be present.

(3) The rate of gas generation is difficult to estimate. The principal gas to be expected is carbon dioxide from decomposition of organic material in the waste, possibly aided by bacterial activity. A little hydrogen may be produced by radiolysis of waste and water, and larger amounts by corrosion of steel in the waste containers. Small quantities of nitrogen will remain from entrapped air. SNL suggests an overall rate of 220 gm (half a pound) of gas per waste drum in 100 years, but this is no more than an educated guess and is not based on quantitative measurements of actual waste drums in a repository environment. SRP considers this figure too low but makes no specific estimate.

In summary, the important variables on which accumulation or non-accumulation of abundant mobile fluid depends can be known only roughly on the basis of available data. SNL calculates a maximum expectable rate of brine inflow of about 43 $m^3$, or slightly over 1 percent of the initial volume of the empty room, in each disposal room in 100 years, an amount that preliminary experiments show could be readily absorbed by the planned backfill and would not form a mobile fluid. SRP rightly points out that the amount could be much larger if salt permeabilities higher in the measured range of values are used for the calculation.

## Critique of the SRP Scenario

The following discussion will consider whether the chance of fluids accumulating in the amounts, character and with the resulting hazard to the environment that are pictured in SRP's scenario is significant. SRP supposes that abundant brine enters voids in the repository from permeable parts of the salt; that the brine moves through the backfill, corrodes the steel containers of the waste, and becomes a thin and mobile "slurry" containing dissolved and particulate material from the waste, backfill, and corroded metal; that radionuclides exist in the liquid partly as dissolved compounds and partly as attachments to suspended particles; that abundant gas is generated and pressure builds up both from the gas and from salt creep; and that the liquid is forced to the surface either through leaks in the shaft seals or through exploratory drill-holes that happen to penetrate the repository sometime in the future when all records of WIPP's existence have been lost. The various parts of this scenario are discussed in the following paragraphs.

Inflow of abundant brine. As noted previously, abundant inflow is possible but only if it comes from exceptionally permeable parts of the salt, or if the effective bulk permeability is much greater than the average of that measured locally in a few boreholes. Permeable zones in the salt will probably be obvious during repository construction, and it seems likely that they can be avoided as the disposal rooms are excavated. As mentioned above, the amount of brine to be expected is more reasonably estimated from the low permeabilities measured by SNL.

Corrosion of steel containers. Both SRP and SNL assume that the steel will corrode not long after the repository is closed. SRP expects the "soft-steel waste containers [to] disintegrate within ... 20 years" and become part of the "slurry." The products are more likely to be iron in solution and solid chunks of the container metal that have been partly or completely oxidized or sulfidized.

Formation of "slurry." The term "slurry" in the SRP paper appears to connote a free-flowing liquid containing dissolved and particulate material derived from partial disintegration of backfill, waste, and corroded metal. Most of the backfill is more likely to persist as a dense mush of salt crystals and bentonite, the waste would be in pieces and shreds of various solids, and the corroded metal would form in discrete chunks. The remaining void space, as yet undetermined, will contain brine and gas, and if the permeability is as low as current estimates by SNL suggest, the amount of liquid brine will be small.

Entrainment of radionuclides. The radionuclides from the waste are assumed to be partly dissolved in the "slurry" and partly attached to its constituent particles, and in either form to be freely moving. Because the principal radioactive species is plutonium, which is insoluble in neutral reducing solutions and strongly sorbed by both bentonite and iron oxide, the amount in dissolved form should be very small. It can be reasonably assumed that there would be some particles containing plutonium but this would be only a fraction of the total radioactive material present, and the particles would not travel far if the "slurry" were to move through small openings.

Generation of gas. As noted above, some formation of gas is very likely, particularly carbon dioxide from the decomposition of organic materials in the waste. SRP postulates in addition abundant hydrogen sulfide, which seems improbable because even if it does appear, it would react readily with dissolved iron to form solid ferrous sulfide. Accumulation of much gas and build-up of high pressure by salt creep as the repository openings are compressed appear to be unlikely, because the gas would slowly move out through the salt or through leaks in the seals of shafts and tunnels. If the salt is permeable enough for much brine to leak in, it is likely that gas would tend to leak out as the gas pressure rises toward lithostatic.

Movement of "slurry" to the surface. SRP assumes that radionuclides can reach the surface by two possible routes: (1) through leaks in shaft seals up into an aquifer in the overlying Rustler formation, thence to the surface with groundwater flow in the aquifer; and (2) through exploratory drill-holes that accidentally strike the repository in the distant future. Release by either route could be prompted by the development of high pressure from gas generation or salt creep; release through drill-holes is possible also without pressure, by the entrainment of waste in fluids used for drilling. If the existence of sufficient mobile fluid is assumed, any of these alternatives could bring radioactive material to the surface in amounts exceeding releases specified by EPA standards. In support of the first alternative, SRP notes that SNL has not yet demonstrated a completely satisfactory method of shaft sealing. Recent SNL in-situ experiments with various sealing techniques, however, are very promising. Release to a Rustler aquifer requires that leaks in the seals be not only present but large enough for passage of particulate matter in the "slurry, a requirement that puts an additional strain on the credibility of this route. The postulated releases through drill-holes are the more plausible of the two routes.

It is worth noting that the radioactive releases just described, even if they were to occur, would not result in a major catastrophe at or near the site. Escape of contaminated brine through a drill-hole from a pressurized cavity would cause a temporary spurt of radioactive liquid, and entrainment of waste in drilling fluid might lead to longer-lasting flow; but both events would mean only brief surface contact between a few individuals and slightly radioactive liquid. Serious harm would be highly unlikely. Release to a potable aquifer could be more dangerous because the fluid would be disseminated over a wider area and ingestion could lead to possible significant exposure; but water from Rustler aquifers is not now potable and is not likely to become so in the future. Meeting EPA standards is a requirement, although failure to achieve compliance at this particular site and with this particular assumed sequence of events would not pose a major threat to the health and safety of a large community.

Thus SRP has presented a scenario of radioactive release at WIPP that could conceivably happen but that seems highly improbable. Given extraordinary permeabilities of salt with continuity to a source of water near the disposal rooms, backfill that takes the form of very small particles, steel containers that corrode in a nearly neutral reducing brine or disintegrate into tiny grains of iron oxide, and heterogeneous waste that generates abundant gas as it breaks down into particles—given all these preconditions, it would indeed be possible for a mobile fluid to form that could bring radionuclides to the surface in amounts exceeding EPA standards. But the necessary assumption of a sequence of improbable events coupled to the drilling of exploratory holes that strike disposal rooms does not make the result credible. It will probably be forever impossible to devise a repository so perfect that someone cannot think of a way in which it might be breached; but such a breaching event must prove credible through a sound program of experimental investigation. Nevertheless, it is essential to have a well conceived experimental program at WIPP to reduce remaining uncertainties as a basis for a conservative performance assessment.

## Conclusions and Recommendations

In response to the request by the New Mexico congressional delegation, the Panel concludes from its study of currently available evidence that the formation of an abundant mobile fluid in a repository at the WIPP site, as postulated by SRP, is very improbable. SRP has nevertheless highlighted some of the uncertainties, long recognized by the Panel, that remain in the existing data, and by so doing has performed a service. To resolve the uncertainties, the Panel makes the following recommendations:

1. The uncertainties are not considered sufficient to warrant a hold on the research activities currently planned at WIPP. A comprehensive, systematic experimental program is needed and should continue, to reduce the uncertainties and to support a conservative performance assessment as required by EPA. Experimental work is particularly important on the permeability of the salt (in particular, the nature, location, extent and continuity of zones of above average permeability) and the generation of gas from the waste. These

quantities are essential for predicting the amount, character, and migration of any fluid that accumulates, and major uncertainties still exist regarding them; the goal of the experimental program should be to reduce the uncertainties with minimal risk.

2. As a first priority, the planned experimental program for a 5-year period must be better defined. Detailed descriptions of the intended experiments have not yet been published, and, without seeing such descriptions, neither the Panel nor any other scientific group has a basis for a meaningful judgment about their ability to reduce current uncertainties.

3. Some of the experiments will require the use of drums containing radioactive waste, and there should be no change in present plans to bring such drums to WIPP beginning in October 1988. Because of continued uncertainty about achieving compliance with EPA standards, the Panel agrees with EEG* that no more drums than those to be used in well-described and necessary experiments be placed underground. Only when the experimental work has substantially reduced the uncertainties about brine accumulation to which EEG and SRP have called attention should additional waste containers be emplaced.

4. Experiments should be designed to lessen uncertainties, not to "verify" preconceived ideas about their probable results. Thought should be given to an appropriate course of action if experimental results turn out contrary to expectation.

5. As experimental results are obtained, performance assessment calculations should be continually refined to test the confidence of achieving compliance with EPA standards.

6. Multiphase models (gas + liquid + solid) should be developed to describe the behavior of the possible complex fluids that may form as brine enters the repository and gas is generated from the waste.

7. Effort should commence immediately to investigate the feasibility of possible technical "fixes" if the problem of fluids in the repository is determined by the recommended experiments to be serious. Examples of such "fixes" are:

    a. the use of "getters" to reduce or control the amounts of gas generated from the waste;

    b. the use of inhibitors to suppress bacterial activity;

    c. methods by which brine in the repository might be drained, for example into some sort of sump;

    d. a decision to leave the repository open for a long period, perhaps 100 years, with ventilation and appropriate monitoring, to ensure consolidation of salt around the waste unhindered by brine or gas pressure build-up;

    e. addition of material to the waste drums to increase sorptive capacity and reduce void space; and

f. as an extreme measure, processing the waste into dense, chemically stable forms before emplacement in the repository.

## References

*Evaluation of the Waste Isolation Pilot Plant (WIPP) as a water-saturated nuclear waste repository. Scientists Review Panel on WIPP, Albuquerque, New Mexico, January 1988.

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## Participants in the Augmented WIPP Panel Meeting
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Senator **Bingaman**. Thank you very much.

Let me just ask a few questions, and then defer to Senator Domenici for his questions.

One question that I have is the request or the suggestion that EPA made that an additional 1.5 percent of the total volume of waste to go to the site would or should be stored in two rooms, so that monitoring could occur there.

First, Mr. Clay, could you explain to us the basis for that suggestion and then I will ask the other witnesses if they have any position or point of view on that.

Mr. **Clay**. The exact suggestion was that a feasibility study be done by the Department of Energy to see if that would be useful to do. So it was not exactly let us go ahead and do it. Let us do a feasibility study; pilot-scale rooms would be at least several years away.

Senator **Bingaman**. So you did not suggest that they put in an additional 1.5 percent. You suggested that they investigate the feasibility or the advisability?

Mr. **Clay**. The feasibility and advisability exactly—a feasibility study. The thinking was that this might be useful, not so much for the test phase per se, but over the life of the project, were it to be permitted, to see how things were going. So it was not a short-term idea at all. It was something that is at least several years away, after a feasibility study.

Senator **Bingaman**. So this is not something you would expect should be done prior to the decision that WIPP does or does not meet EPA standards?

Mr. **Clay**. Well, the proposed variance that we just proposed does not cover the 1.5 percent, the two rooms.

Senator **Bingaman**. So your variance just covers the .5 percent?

Mr. **Clay**. The approximately .5 percent, yes, sir.

Senator **Bingaman**. So that if they wanted to or if the DOE wanted to pursue that additional 1.5, they would have to come back to you and go through that whole process again to get another variance?

Mr. **Clay**. That is correct, including public comment.

Senator **Bingaman**. Dr. Fairhurst, Dr. Rice, do either of you have comments as to whether this is something you have looked at or makes sense or in what context you think it might make sense?

Mr. **Rice**. I will answer first. I think that in the context of our recommendations of a graded approach—that is, starting with a reasonable confidence that WIPP will be able to meet the Subpart B standards in order to proceed with the test phase, and then, the second in our recommendations, having achieved a higher level of confidence of being able to proceed into an operations demonstration—I think such a graded approach envelopes the EPA recommendation.

Senator **Bingaman**. You are going to have to restate what you just said for me. I did not understand it.

Mr. **Rice**. Let me refer back to the recommendations that the committee made on the long term environmental effects. The emplacement of TRU waste, the transuranic waste, for the experimental test program should be based on an analysis that there is a reasonable degree of assurance that the Subpart B standards would eventually be met. That is in our recommendations.

It makes sense to go find out if there are any big problems out there that makes it look like WIPP would not work at all. And then, continuing on from there, we recommended that the Department continue the performance assessment and experimental test programs, including the study of the gas generation issue, to gain higher confidence in the expectation of achieving the Subpart B compliance.

The point here is, that upon determination that a high degree of confidence exists in WIPPs compliance with EPA Subpart B standards, the Department could initiate the operational test phase as a graded emplacement program committed to deliberate steps to evaluate and work out problems.

In other words, we are saying that it is not all-or-nothing; rather, a process of deliberate steps.

Senator **Bingaman**. So as I understand what you are saying, you are saying the period prior to compliance with EPA standards would be essentially in two parts, and you would have the first part, where you would be doing these gas generation experiments and then, once you gained some confidence that you are likely to meet EPA standards, then you would begin doing other things that you designate operational testing, and that would require additional waste at the site and the EPA's 1.5. percent would be included in that operational testing phase?

Mr. **Rice**. They are compatible. That is all I am saying.

Senator **Bingaman**. They are compatible. You have not really looked at it, but it might be compatible.

Dr. Fairhurst, is there anything you folks considered?

Dr. **Fairhurst**. We have not been asked to look officially at that, but I would concur directly with what Mr. Rice has just said. It would be part of a later phase. In this first phase we are not even sure what the waste form is going to be, for example, and we need to answer some of those questions before we go with what I think would be an appropriate EPA test.

Senator **Bingaman**. The other question I asked of Secretary Watkins and Leo Duffy was related to the question of whether we could or DOE could go ahead and do these experiments that are intended to be accomplished with the .5 percent at someplace other than the site.

Could they go ahead next week and gear up to do those experiments somewhere else where the waste already is? And then we in Congress and DOE and everybody else would not be under such pressure to pass land withdrawal legislation because the results of those tests are going to take three or four years at a minimum and we could get the results of those tests without moving waste to the site.

Is that something that the two panels have looked at? Dr. Fairhurst, did you have a position on that?

Dr. **Fairhurst**. Certainly some aspects of the underground tests can be carried out on the surface. But I think Mr. Duffy made the comment, which I will endorse, that there will always be the question of certain interactions, et cetera, that will not be seen until underground tests have been carried out.

Let me, for example, say that in the room closure experiments that were carried out, when it was found out that three times the rate of closure was happening than what had been found in the laboratory predictions, that we did not know until we did underground tests.

The brine question did not come up at all from any laboratory information. It came from the underground. WIPP exists as an underground facility in order to carry experiments through the underground test phase, and it is difficult at one stage to say specifically what will you get from certain of the underground tests.

The point is that that is a phase that you have to go through to really evaluate the concept thoroughly. So I think that even if some parts of the tests can be done on the surface, one will still have to do the underground gas generation tests.

Senator **Bingaman**. Mr. Rice, did you have a position?

Mr. **Rice**. I do not have any different comments than Dr. Fairhurst on that.

Senator **Bingaman**. Mr. Clay, did you have a position on that issue?

Mr. **Clay**. Yes, we do. We think that it is sensible. The conditions that we put forth in our proposed variance we think would allow it to be done safely. We think that we have the readily retrievable agreement to retrieve if it does not work. Clearly for the alcove test you would have to do it there. You can make an argument on the bin test being somewhere else, but if you are going to worry about the alcove and how fast rooms close and what have you, I think it has to be done there.

So we think it can be done safely. That is the nature of our finding. We proposed that. If we do that, we think that it can be done and should be done there.

Senator **Bingaman**. Mr. Clay, let me ask one other question. This is a follow-on to what Senator Domenici earlier raised. We went through a little change in position, we thought, with DOE previously wanting to self-certify compliance with EPA standards, and more recently it was our understanding that DOE had agreed that EPA should certify compliance with EPA standards.

Does EPA have a position on how that ought to be done, which of the two procedures makes the most sense or leaves you the most satisfied?

Mr. **Clay**. I think we have got to be careful that we differentiate that there are two parts of EPA standards that we are talking about. In terms of the hazardous waste standards, which we have under RCRA, which is the basis of the no-migration test, I do not think that there has been recent discussion of EPA not being involved in those.

So in that sense that is not true.

Senator **Bingaman**. Just a second. I am not understanding. You say in that sense that is not true. Would you explain that?

Mr. **Clay**. I do not think anybody is proposing that EPA not be involved with that, the no-migration petition.

Senator **Bingaman**. So you expect to certify compliance with what you just issued a waiver on?

Mr. **Clay**. The hazardous waste component, I think that we believe we are on the right track with the no-migration petition. As far as I know, the Department of Energy agrees with that and they have certainly submitted their petition and are awaiting the results of what we find out.

With respect to radiation standards, that is a different story. Radiation standards are promulgated by EPA under authority of the Atomic Energy Act. The way that is normally implemented is in fact for the Nuclear Regulatory Commission to do civilian and Department of Defense and for the Department of Energy to do themselves.

The land withdrawal bill that the Administration is developing would continue that practice, where the Department of Energy would in fact certify their own compliance with the EPA radiation standard.

Senator BINGAMAN. Yes. But I am asking you whether instead of having DOE certify their own compliance we have EPA certify DOE's compliance. That seems preferable to those of us in the Congress who have looked at it, Senator Domenici and myself. Do you see a problem with that?

Mr. CLAY. Well, the Administration is coming up with a counterproposal, and I would be happy to provide a response in writing to any particular proposal you have counter to that. But I am not prepared at this time to endorse that.

Senator BINGAMAN. Let me defer to Senator Domenici.

Senator DOMENICI. Could I, for the three of you, put into perspective as I see it the questions that Senator Bingaman has been asking, which have to do with how much waste should be brought onto this site for experimental purposes and tell you why it is a genuine, serious issue for some of us who have watched the way we have handled waste of this type and its disposition?

At the heart of this whole process is the word "retrievability", which everybody is basing their testimony to us on. But, on the other side, that retrievability seems to be lost from the standpoint of those who want a rush to solve America's problems with a permanent repository called WIPP, such that, believe it or not, less than two years ago we were talking about 15 percent as somebody's dream that it was necessary to prove the site up.

Then we had Rocky Flats and we have an ultimatum from someone—no more waste in Idaho. The euphoria was get it open in New Mexico. We sit here with everybody telling us and us telling our cituzens this is not a disposal site yet because it is all retrievable. But, frankly, I am very concerned that if you start down the path of putting the waste in, conditions that are logical to make it truly retrievable and to do only what is necessary to prove it up can get lost in the shuffle because everybody thinks you have now got a place to put the waste.

Frankly, I believe it is a hard sell to say it is a site but it is not a site. That is kind of what we are talking about here. So when we ask how much and why hurry up with the land withdrawal bill, speaking from my standpoint—and I think Senator Bingaman joins me—we intend to put some very, very tight restrictions in on how much can be put in there before it becomes certified as a disposal site.

I personally think if you get 10 or 15 percent in there the retrievability idea is going to get lost in the shuffle—maybe not from the scientists' standpoint. So we are very interested and concerned about how much.

When we get this .5 percent talked about on the one hand, and then we get operational ideas that are 1.5, and we have somebody else talking about two, do you understand the seriousness of the issue? I mean, we need not look very far around the country at what is happening to understand that that is a very serious problem for those of us who on the one hand are telling people it is not yet a disposal site and yet we are talking about bringing waste there.

Having said that, could I ask EPA the 5/10ths of a percent that you have, under this RCRA conditional—what do you call it?

Mr. CLAY. Proposed no migration variance. We have not granted it at this time.

Senator DOMENICI. Do I understand now with reference to RCRA, which governs hazardous waste, not radioactive waste, that under current law if they go beyond 5/10ths of a percent it is back in EPA's lap for a further no migration petition?

Mr. CLAY. Almost, but not quite, because the conditions that we granted did not limit it to 5/10ths of a percent, per se. It said for testing and experimentation of the type described in the petition. So that includes such things as readily retrievable. It includes stand-off walls if you are going to have backfill which would preclude the 1½ percent, without doing that. We specifically excluded the operations test by fiat in the proposed permit, or proposal to do that, so the operations demonstration, specificaly you would have to come back for.

The 1½ percent you would have to come back for because you cannot have the repository walls in contact with backfill. But we did not exactly limit it to .5 percent, or the 7,500 drums. We felt that was too restrictive. It has to be for the testing and experimentation. If they do something beyond the scope of what they described to us they have to come back to us. if it is significant, then we have to go back and repropose.

Senator DOMENICI. Then what did you mean when you answered Senator Bingaman and he asked you to repeat your answer and you were using 5/10ths of a percent and I think that was in his question? What were you referring to then?

Mr. CLAY. That is the types of experimentation to be done in the bins and alcoves, which is estimated to be around 5/10ths of a percent. It may go slightly higher. I would not think it would go significantly higher.

Senator DOMENICI. So is that 5/10ths of a percent or slightly higher—does that do all the things that you have allowed them to do, or is there something else they can do that might make it 1 percent or 2 percent without having to come back to you?

Mr. CLAY. They can only do the testing and experimentation of easily retrievable, readily retrievable waste, what have you, of the nature that they have described to us in their petition, which is a very extensive petition, by the way. It is mostly bins and alcoves testing.

Senator DOMENICI. Can anybody quantify that, so that we are talking about limiting it with a quantity because of the concerns at least I have that I have just expressed? Do we have a number? If it is not 5/10ths, what is it?

Mr. CLAY. I do not know, but you could probably pick a number. Say, not to exceed something like 1 percent, which would give them the flexibility. We anticipate around ½ a percent. I do not think, certainly in our minds, that is what they have in mind and I believe them, but you can put a ceiling on that.

We just felt for the—scientifically as you go you are going to learn more, you may want to modify the tests slightly. But again, keeping in mind, bins and alcoves is what we are talking about and the purpose is what is important.

Senator DOMENICI. Can I stay with EPA for just a minute? Mr. Clay, when does EPA expect to establish the Subpart B standards in draft and in final form?

Mr. CLAY. We think we will have the draft out by late 1990; the final rule in mid-1992.

Senator DOMENICI. Are you adequately funded to do this job? One of the delays for a while was that there was not enough money there, and my recollection is we put in a specific appropriation for you so you would not have deficient resources as a justification for taking longer. Do you have enough resources to do the job now, on time?

Mr. CLAY. I am told the resources are okay, but I may want to elaborate on that. The actual drafting of the radiation standard does not fall in my part of EPA. It is part of the Assistant Administrator for Air and Radiation.

Senator DOMENICI. Can you answer this one? Has DOE provided EPA with any information demonstrating that WIPP is in compliance with Subpart A, not B, of the standards for temporary storage?

Mr. CLAY. I will have to provide that answer for the record, Senator.

Senator DOMENICI. I think that is a very important question I hope you will ask.

Mr. CLAY. Subpart A in fact is in force now, but I do not know personally if they have provided that information and I will get you that answer for the record.

Senator DOMENICI. To the best of your knowledge, has DOE completed the systematic assessment of the long-term safety and effectiveness of WIPP that EPA recommended?

Mr. CLAY. We can have the radiation expert come forward, or we can provide it for the record. I do not know personally.

Senator DOMENICI. Perhaps we had better just submit these. I think they are important from the standpoint of how urgent is a land withdrawal bill and how minimal would the conditions in it be? These are all things that you have recommended and they claim they will be ready by a time certain and I think we are not going to have hearings every three months, so we ought to know where they really are.

Mr. CLAY. My nonresponse was not that I did not think it was important. It is just not my area of responsibility.

Senator DOMENICI. Is your radiation man here?

Mr. **Clay**. Yes, sir. We have the Radiation Division Director. Mr. Bill Gunter is with us. We could have him come forward if you would like.

Senator **Domenici**. I do not want to labor the record or keep you excessively.

Senator **Bingaman**. That is fine, if you would like to have a question answered, come right ahead. Please just state your name and the position you hold.

Mr. **Gunter**. My name is William Gunter. I am the Director of the Criterion Standards Division in the Office of Radiation Programs of EPA.

Senator **Domenici**. Might I ask you, has DOE provided EPA with the information demonstrating that WIPP is in compliance with Subpart A?

Mr. **Gunter**. No. Subpart A is not legally applicable until the facility is declared to be a disposal facility. However, DOE has committed that they are going to comply with Subpart A during the test period despite the fact that it is not legally applicable. They have not come forward with that kind of information at this time.

Senator **Domenici**. Well, Subpart A is temporary storage, is it not?

Mr. **Gunter**. At a disposal facility.

Senator **Domenici**. What is Subpart B then?

Mr. **Gunter**. That is for the period after the facility is closed and over the long haul, for thousands of years.

Senator **Domenici**. So the only standards we are going to be looking at until we finish this are the Subpart A standards?

Mr. **Gunter**. It is not the only standards that we are going to be looking at, because the purposes of the test, one of the purposes of the test is to generate the information necessary to demonstrate that compliance with Subpart B over the 10,000-year period is achievable.

Mr. **Clay**. Until the decision is made that you can have permanent disposal there, it is not a disposal site, it is a research and development site, and A does not apply, I think is the clarification. It is a research and development site.

Senator **Domenici**. Well then, this is one I had better get cleared up, because I have been assuming that we have a Subpart A, which is the storage, which is obviously less than a disposal, and that Subpart B is the standard that would apply for a disposal—permanent form disposal.

Mr. **Gunter**. Post-closure, yes.

Senator **Domenici**. Post-closure is the only place that B applies?

Mr. **Gunter**. That is correct.

Senator **Domenici**. So tell me again what is the status on part A?

Mr. **Gunter**. Subpart A applies legally beginning at the time when the facility is determined to be a disposal facility and lasting on through the operational lifetime of the facility up to closure..

Senator **Domenici**. So what applies in the intervening time?

Mr. **Gunter**. Legally, Subpart 191 does not apply. As I said earlier, the Department of Energy has committed that during this test phase they will comply with Subpart A, but it is not legally applicable.

Senator DOMENICI. So RCRA applies, which is a separate body of law, and nothing else, by way of a standard?

Mr. GUNTER. Nothing that is legally applicable from the Atomic Energy Act standards viewpoint.

Senator DOMENICI. All right. Can I ask you just three quick questions? Has DOE completed the systematic assessment of the long-term safety and effectiveness that EPA recommended?

Mr. GUNTER. Which assessment is this, now?

Senator DOMENICI. I will just repeat the words. They come right out of a letter EPA sent to them: "systematic assessment of the long-term safety and effectiveness."

Mr. GUNTER. That, I believe, is referring to the longer term compliance with Subpart B standards, I believe.

Senator DOMENICI. Can we submit the letter to you and answer if they have complied?

Mr. GUNTER. Yes.

Senator DOMENICI. How about prepared a report on waste technologies and engineering improvements that EPA recommended?

Mr. GUNTER. We have not seen that yet.

Senator DOMENICI. Waste recovery experiment with simulated waste that EPA recommended?

Mr. GUNTER. We have not seen that.

Senator DOMENICI. A summary of the models describing how gas generation may affect the performance of WIPP that EPA recommended?

Mr. GUNTER. We have not see that.

Senator DOMENICI. I assume it is obvious from what is occurring that you do not see any justification for exempting WIPP from RCRA. Anybody here?

Mr. CLAY. Not at this time, no. At this time we are not prepared to support that.

Senator DOMENICI. Is there an answer that deserves another question?

Mr. CLAY. That is for the Senator to determine, I think.

Senator DOMENICI. What do you mean, at this time? I hate to do that, not having any idea what the answer will be, but I guess we could just as well do it. What does that mean, not at this time?

Mr. CLAY. Clearly, there is a debate going on within the Administration on what the answer is, and that debate is not concluded yet, so I am not prepared to say what the Administration's final position might be.

Senator DOMENICI. But it is fair to say that going into this process the Environmental Protection Agency has determined that the contents of the RCRA law would seem to indicate that it applies here, or you would not be involved, I guess. Is that a fair statement?

Mr. CLAY. We would be involved. Hazardous waste is in fact my area, and as the law is written today it does in fact cover that—the mixed waste. We have made that very clear, since 1986. So unless the law were to be changed, RCRA applies.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator BINGAMAN. Let me just ask a couple of other questions to nail down this suggestion. I have this letter dated October 19 from EPA to Richard Guimond, is that correct?

Mr. CLAY. Rich Guimond. From him, or to him?

Senator BINGAMAN. From him to the Department of Energy, Deputy Assistant Secretary for Nuclear Materials. It says here, "We believe that DOE should carefully evaluate the feasibility of loading two full-size rooms with waste and back-filling and sealing them during or immediately after the test phase."

That is the basis upon which DOE has requested the additional 1½ percent authority.

Mr. CLAY. DOE has not officially requested the 1½ percent authority at this time.

Senator BINGAMAN. They have requested it of the Congress here. It says—this is Secretary Watkins' testimony this morning: "I have concluded that up to approximately 2 percent of WIPP's design capacity could be required during the test phase."

Mr. CLAY. I believe he goes on to say that if they do that they will go back and ask for a no migration permit for the 1½ percent.

Senator BINGAMAN. So I just want to be clear that your suggestion was—EPA's suggestion was to DOE that DOE evaluate the feasibility of doing these two full-sized rooms during or immediately after the test phase. Is there any particular preference as to whether they should do it during or immediately after?

Mr. CLAY. I think the answer, as Mr. Rice and Dr. Fairhurst said earlier, it may be too soon to do it now. You may be treating some of the waste and what have you, so you have got to let that go by. I think they are at least one to two years away from making those kinds of determinations.

Senator BINGAMAN. Would there be a big problem if we decided they ought to do it but immediately after the test phase and not during the test phase?

Mr. CLAY. I would defer to others more scientifically knowledgeable than I, but I do not think that would be a problem, because we do not believe that it provides information that is going to be essential for granting our permanent variance or not, so it is something more for the long-term, so as far as I know it could be after.

Senator BINGAMAN So it could be after you determine whether compliance with Subpart B is possible, and essentially make that decision that the WIPP facility can be used as a repository?

Mr. CLAY. Keep in mind, Subpart B is Mr. Gunter in the Radiation Program. He may want to add something.

Senator BINGAMAN. Did you have a comment?

Mr. GUNTER. I would like to add one comment. This concept of the pilot skill rooms originates with a requirement that was in the 1985 rule, which says that disposal systems shall be monitored after disposal to detect substantial and detrimental deviations from expected performance.

Senator BINGAMAN. That is after disposal?

Mr. GUNTER. That is after disposal, and a great deal of attention has been focused on this determination of compliance with Subpart B, and rightly so, but it is also important that during the period after that determination is made and while the facility is operating, throughout its operating lifetime, that monitoring be continued to confirm that the repository is performing as expected, and this is the primary objective of these pilot rooms, to enable DOE to do that monitoring.

Senator BINGAMAN. So I guess what you are saying, then, is that the main thrust of what you are trying to say is that after we determine, if we do, that WIPP is a proper disposal site, then this ongoing monitoring should continue and these two rooms would be helpful to accomplish that?

Mr. GUNTER. That is correct.

Senator BINGAMAN. So, if we are trying to be consistent with that, there is no reason why the Congress should authorize the movement to the site of that 1.5 percent for emplacement in those two rooms until there is a determination that the site will be used as a disposal site.

Mr. GUNTER. Not necessarily so, but we did say that it could be either during or after. The primary purpose is for the period after.

Senator BINGAMAN. For your purposes after it is just as good as during?

Mr. GUNTER. That is correct.

Senator BINGAMAN. I think that is a useful clarification.

Mr. CLAY. If I could clarify that just a tad further, too. That cannot be done without an additional no migration petition, including public comment, so it is not about to happen fast.

Senator BINGAMAN. I understand. And presumably once you determine that the site, if you do determine that the site can be used as a disposal site, then they would be able to go ahead and put waste in the site pursuant to a no migration petition that they would submit for the rest of the waste.

Mr. CLAY. That is correct. For the final decision there is at least one more no migration petition coming based on the results of the tests, one final one. If they want to go to the 1.5 percent, there will be two more.

Senator BINGAMAN. But if they collapse the 1.5 percent into the total, then there is just one, and you would give them a green light to go ahead with the whole thing, assuming they met EPA standards at that time?

Mr. CLAY. That is correct.

Senator BINGAMAN. I think that helps clarify it.

Senator Domenici, do you have any other questions?

Senator DOMENICI. I would not have had, but I knew that subpart A was bothering me and that I did not have that easy an answer in my head. So, would you permit me, Mr. Chairman.

In the agreement with the State of New Mexico, modification to the July 1, 1981 agreement, this paragraph is found, "The final safety analysis which will be issued by DOE prior to the receipt of waste, will document DOE's ability to comply with the provisions of subpart A of the environmental standards of the Environmental Protection Agency for management and disposal of spent fuel," 40 CFR, Part 191 Subpart A. "Upon initial receipt of radioactive waste at WIPP and thereafter, DOE will comply in all respects with said subpart A in effect at the time."

Now, I think that becomes relevant because the DOE has regularly said—this is one part of this agreement I believe they think is binding—they have said they are going to try to do this. That is why my question to you was have they supplied the requisite plan indicating that they are ready to comply with this.

Mr. GUNTER. We have not seen that.

**Mr. Clay.** But the question, as we understood it, this is an agreement with the state and is binding on them, so they would give it to the state, not to us. It does not become binding as a federal requirement until such time as it becomes a disposal facility.

So, we have every reason to believe—they have said they are going to do it, but it would go to the state. It would not go to us.

**Senator Domenici.** Now, frankly, I am not arguing about somebody's good faith or interagency interpretations. I mean, I happen to disagree right off with your interpretation. I think it is between the state and the Federal Government, but I think it would be within this committee's authority to ask you, the EPA, whether what they have submitted to the state does this. How else would we know? I mean, because DOE says it?

That is why I think it is part of this. We will probably ask you when they have submitted this: Does it indicate that they are in all respects acting as if subpart A was in effect?

**Mr. Clay.** And we will be pleased to respond.

**Senator Domenici.** I have one last one.

Senator Bingaman referred to a letter of October 19th, so I am just going to make it clear again—this is your letter, the one he referred to, and on page 3 recommendation one, DOE should as recommended by NAS develop and publish within the next six months a systematic assessment of the long-term performance of WIPP.

And my question was have they done that yet?

**Mr. Gunter.** I understand that they have developed it. I do not believe it has been published. I know that I have not seen it.

**Senator Domenici.** So I have it tied in. Should you be seeing it and should you analyze it?

**Mr. Gunter.** We would be happy to do so.

**Senator Domenici.** It is not part of your concern and your problem? I mean, you submitted it as something you think we ought to do.

**Mr. Gunter.** Yes, we did, and I understand that that is now due in June.

**Senator Domenici.** Now due in June. Thank you, Mr. Chairman. Thank you all very much.

**Senator Bingaman.** Yes. Thank you all. Let me just indicate for anybody interested that this set of hearings will continue on the April 26, We will have additional witnesses on the question of the land withdrawal in issue of WIPP. Thank you all very much for testifying. We appreciate it very much.

[Whereupon, at 12:41 p.m., the committee recessed, to reconvene Thursday, April 26, 1990.]

# WASTE ISOLATION PILOT PLANT LAND WITHDRAWAL

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THURSDAY, APRIL 26, 1990

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
*Washington, DC.*

The committee met, pursuant to notice, at 2:03 p.m., in room SD-366, Dirksen Senate Office Building, Hon. Jeff Bingaman, presiding.

## OPENING STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

Senator BINGAMAN. The hearing will come to order. The Chairman, Senator Johnston, is on the Senate floor this afternoon, with the supplemental appropriations bill and is not able to be here, but we do have a statement from him that we will include in the record.

This is a continuation of a hearing that the Committee held on April 3rd, to receive testimony on the Waste Isolation Pilot Plant. I want to thank Chairman Johnston for agreeing to schedule this second day of hearings so that we could accommodate those who wish to testify.

WIPP is designed, of course, to be an underground research and development facility, to demonstrate the safe disposal of transuranic radioactive wastes which result from the U.S. nuclear defense activities and programs. The facility is intended to be used to demonstrate the behavior of radioactive waste in a geologic repository and also the handling, certification and transportation of such wastes. The facility is located in southeastern New Mexico near Carlsbad.

Both Senator Domenici and I are well acquainted with this project. I became acquainted as Attorney General of New Mexico and when we litigated with the Department of Energy on the role the state would be able to play in continuing to look after its own safety and health concerns. This legislation, which was introduced in the last Congress, Senator Domenici and I both introduced to accomplish the withdrawal of the land, is an item we had many hearings on as well.

The legislation was reported out of committee. It was never considered by the full Senate. Chairman Johnston recently introduced the administration's land withdrawal legislation that Secretary Watkins made reference to in his April 3rd testimony.

I believe there are several key issues that still need to be resolved before legislation moves forward. Today we will hear about some of those issues from the State of Mexico, from members of the scientific community and interested local officials and public interest organizations from New Mexico.

[The prepared statement of Senator Johnston and the text of S. 2420 follows:]

# STATEMENT OF SENATOR J. BENNETT JOHNSTON

Hearing on the Waste Isolation Pilot Plant

April 26, 1990

Good afternoon. Today's hearing is a continuation of the Committee's April 3 hearing on the Waste Isolation Pilot Plant in Carlsbad, New Mexico. The Waste Isolation Pilot Plant is the Department of Energy's facility for defense transuranic waste. The WIPP facility is an important element of the Department's plans for cleaning up the nuclear weapons complex.

On April 3, we heard from a distinguished group of witnesses on the status of WIPP and on its readiness to open to begin a five-year demonstration phase. Admiral Watkins, the Secretary of Energy, told this Committee that he expected to be able to make a decision in June on when WIPP would be ready to open. The Admiral said he anticipated that all prerequisites for emplacement of waste in WIPP could be met as early as October 1, 1990. Admiral Watkins also urged the Committee to act quickly on legislation to withdraw the public lands surrounding WIPP.

Today we will hear from additional witnesses on the Department of Energy's plan for WIPP. These witnesses will also testify today on proposed land withdrawal legislation, S. 2420, which was introduced at the request of the Administration on April 4.

WIPP is a research and development facility of the Department of Energy that was authorized for the purpose of demonstrating the safe disposal of radioactive waste generated by DOE's nuclear weapons production activities. The WIPP facility -- built 2,000 feet below the surface in the Delaware salt basin in New Mexico -- has been under construction since 1981. Construction of the facility is now completed, and the facility will soon be ready to begin the demonstration phase.

The opening of the WIPP facility is a very important part of the weapons production cycle because it will demonstrate that we have the technology necessary to store and dispose the byproducts of these weapons safely.

Transuranic waste from our nation's defense production activities is generated and stored at 10 DOE sites around the country. At some of these sites, we are running out of the limited temporary storage space. Therefore, the opening of this facility will be an extremely important step in demonstrating that the defense waste cleanup is underway.

Admiral Watkins has made significant progress at the Department of Energy in bringing order and excellence to the WIPP project, as with the many other programs at the Department.

Under the Admiral's guidance, the Department has prepared a draft Decision Plan on WIPP, identifying the activities that need to be completed prior to its opening. I am encouraged that we seem to be moving quickly toward completion of many of these activities. There are still a number of items to be resolved, but I am optimistic that they can be completed in a reasonable timeframe.

I am pleased that the Administration forwarded to the Congress proposed land withdrawal legislation. It is important that we get started working on this legislation now so that the opening of this facility will not be delayed by the failure of the Congress to enact legislation.

The Administration's bill would permanently withdraw the lands surrounding WIPP from the public domain and transfer it to control by the Department of Energy. It would be possible to continue use of the land under another administrative land withdrawal -- at least for the demonstration phase. However, both the Department of Energy and the State of New Mexico have indicated a preference to withdraw the land permanently through legislation.

This Committee reported legislation in the 100th Congress, and we worked hard with our colleagues from New Mexico, Senators Bingaman and Domenici, to complete this action in 1988. But time ran out, and unfortunately we must start all over again. It is my hope that we will be able to report legislation out of this Committee quickly.

II

101ST CONGRESS
2D SESSION

# S. 2420

To withdraw certain public lands in Eddy County, New Mexico, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

APRIL 4 (legislative day, JANUARY 23), 1990

Mr. JOHNSTON (by request) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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# A BILL

To withdraw certain public lands in Eddy County, New Mexico, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

## SECTION 1. SHORT TITLE.

This Act may be cited as the "Waste Isolation Pilot Plant Land Withdrawal Act".

## SEC. 2. DEFINITIONS.

As used in this Act—

(1) "Administrator" means the Administrator of the Environmental Protection Agency.

(2) "Agreement" or "Agreement for Consultation and Cooperation" means the July 1, 1981, Agreement for Consultation and Cooperation, as amended by the November 30, 1984, "First Modification" and the August 4, 1987, "Second Modification," or as it is amended after the date of enactment of this Act, between the State of New Mexico and the United States Department of Energy as authorized by section 213(b) of the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Public Law 96–164).

(3) "EEG" means the Environmental Evaluation Group for the Waste Isolation Pilot Plant referred to in section 1433 of the National Defense Authorization Act, Fiscal Year 1989 (Public Law 100–456).

(4) "Secretary" means the Secretary of Energy.

(5) "WIPP" means the Waste Isolation Pilot Plant project authorized under section 213 of the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Public Law 96–164).

## SEC. 3. LAND WITHDRAWAL AND RESERVATION FOR THE WIPP.

(a) WITHDRAWAL, JURISDICTION, AND RESERVATION.—(1) Subject to valid existing rights and except as otherwise provided in this Act, the lands described in subsection (c) are withdrawn from all forms of entry, appropriation, and disposal under the public land laws (including the mineral leasing laws, the geothermal leasing laws, and the material sale laws, except as provided in section 4(b)(2)(D) of this Act), and from location, entry and patent under the mining laws. These lands shall be known as the "Waste Isolation Pilot Plant Withdrawal" (referred to in this Act as the "Withdrawal").

(2) Jurisdiction over the Withdrawal if tranferred permanently from the Secretary of the Interior to the Secretary of Energy. The Withdrawal is permanently reserved for the use of the Secretary of Energy for the construction, operation, repair and maintenance, shutdown, monitoring, decommissioning post-decommissioning control, and other authorized activities associated with, and limited by, the mission of the WIPP.

(3) The Withdrawal provided in this section takes effect on the date that the Secretary of Energy notifies the Congress of the Secretary's determination that the following activities have been completed:

(A) a Final Safety Analysis Report for the WIPP that addresses performance assessment test phase activities and that is—

(i) prepared by the Department of Energy under its safety analysis procedures and reviewed by the Department of Energy's Advisory Committee on Nuclear Facility Safety;

(ii) submitted to the State of New Mexico and the EEG; and

(iii) approved by the Secretary.

(B) a Record of Decision on the Supplemental Environmental Impact Statement that applies to test-phase activities; and

(C) a No-Migration Variance that, at a minimum, applies to test-phase activities and has been granted by the Environmental Protection Agency under section 3004 of the Solid Waste Disposal Act (42 U.S.C. 6921, 6924).

The Secretary shall arrange for the notification to be published in the Federal Register.

(b) REVOCATION OF PUBLIC LAND ORDERS.—Public Land Order 6403, of June 29, 1983, and the memorandum of understanding accompanying that order, are revoked on the effective date of the Withdrawal under section 3(a)(3) of this Act.

(c) LAND DESCRIPTION.—

(1) The boundaries depicted on the map issued by the Bureau of Land Management of the Department of

the Interior, entitled "Current Boundaries of the Waste Isolation Pilot Plant Site," dated March 1990 and on file in the State of New Mexico Office of the Bureau of Land Management, are established as the boundaries of the Withdrawal.

(2) Within thirty days after the Withdrawal takes effect under the terms of this Act, the Secretary of the Interior shall—

(A) publish in the Federal Register a notice containing a legal description of the lands withdrawn and reserved by this Act; and

(B) file copies of the map and the legal description of the lands with the Committee on Energy and Natural Resources of the United States Senate and with the Committee on Interior and Insular Affairs of the United States House of Representatives, the Secretary of Energy, and Governor of the State of New Mexico.

(d) TECHNICAL CORRECTIONS.—The map and legal description referred to in subsection (c) have the same force and effect as if they were included in this Act, except that the Secretary of the Interior may correct clerical and typographical errors in the map and legal description.

(e) WATER RIGHTS.—This Act does not establish a reservation to the United States with respect to any water or water rights on the Withdrawal. This Act does not authorize the appropriation of water on the Withdrawal by the United States after the date of enactment of this Act, except in accordance with the laws of the State of New Mexico. This Act does not affect water rights acquired by the United States before the date of enactment of this Act.

### SEC. 4. ESTABLISHMENT OF MANAGEMENT RESPONSIBILITIES.

(a) GENERAL AUTHORITY.—The Secretary shall be responsible for the management of the Withdrawal and the WIPP and shall consult with the State of New Mexico in discharging those responsibilities as well as any other responsibility required by this Act.

(b) MANAGEMENT PLAN.—(1)(A) Within one year after the date of enactment of this Act, the Secretary, in consultation with the State of New Mexico, shall develop a management plan for the use of the Withdrawal.

(B) Any use of the Withdrawal for activities not associated with the WIPP shall be subject to conditions and restrictions that may be necessary to permit the conduct of WIPP activities.

(2) The management plan shall address other uses of the Withdrawal, including, but not limited to, domestic livestock grazing, hunting and trapping, maintenance of wildlife habi-

tat, the disposal of salt tailings remaining on the surface, and mining, in accordance with the following:

(A) GRAZING.—The Secretary shall permit grazing to continue where established before the date of enactment of this Act subject to regulations, policies, and practices that the Secretary determines necessary or appropriate. The management of grazing shall be conducted in accord with—

(i) title IV of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1751 et seq.);

(ii) the Act entitled "An Act to stop injury to public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes," approved June 28, 1934 (43 U.S.C. 315 et seq., commonly referred to as the "Taylor Grazing Act"); and

(iii) Executive Order 12548 (51 Fed. Reg. 5985).

(B) HUNTING AND TRAPPING.—The Secretary shall permit hunting and trapping within the Withdrawal in accordance with applicable laws and regulations of the United States and the State of New

Mexico, except that the Secretary of Energy, after consultation with the New Mexico Department of Game and Fish, may issue regulations designating zones where, and establishing periods when, no hunting or trapping is permitted for reasons of public safety, administration, or public use and enjoyment.

(C) WILDLIFE HABITAT.—In order to preserve the wildlife of the Withdrawal, the Secretary shall manage the Withdrawal so as to maintain the wildlife habitat.

(D) SALT TAILINGS.—Notwithstanding any other law, the Secretary shall dispose of salt tailings that are extracted from the Withdrawal and that are not needed for backfill at the WIPP. Disposition shall be made under sections two and three of the Act of July 31, 1947, as amended (30 U.S.C. 602, 603; commonly referred to as the "Materials Act of 1947").

(E) MINING.—Surface or subsurface mining unrelated to the mission of the WIPP, including slant drilling under the Withdrawal from within or without the Withdrawal, shall not be permitted on or under the Withdrawal, before or after decommissioning.

(c) CLOSURE TO THE PUBLIC.—If the Secretary determines that the health and safety of the public or the common defense and security require the closure to public use of any road, trail, or other portion of the Withdrawal, the Secretary may take whatever action the Secretary determines to be necessary or desirable to effect and maintain closure.

(d) COOPERATIVE AGREEMENTS.—The Secretary may enter into cooperative agreements—

(1) with the Secretary of the Interior and the State of New Mexico for the administration of grazing within the Withdrawal; and

(2) with the State of New Mexico for the maintenance of the wildlife habitat of the Withdrawal.

(e) SUBMISSION OF PLAN.—Within one year after the date of enactment of this Act, the Secretary shall submit the management plan developed under subsection (b) to the Committee on Interior and Insular Affairs of the United States House of Representatives, the Committee on Energy and Natural Resources of the United States Senate, and the State of New Mexico. Any amendments to the plan shall be submitted promptly to those committees and the State of New Mexico.

### SEC. 5. PERFORMANCE ASSESSMENT TEST PLAN.

The Secretary shall develop a WIPP performance assessment test plan in consultation with the National Academy of Sciences, the Administrator, the Governor of the State of New Mexico, and the EEG, that addresses experiments to demonstrate compliance with applicable Environmental Protection Agency standards for disposal of transuranic waste, other experiments that the Secretary considers to be necessary to assure the protection of the health and safety of the public, the timing of experiments, an estimate of the quantities and types of waste required for any of these experiments, and the data required to make a performance assessment.

## SEC. 6. OPERATIONS PERFORMANCE DEMONSTRATION.

Prior to the time the Secretary submits a statement to the Congress and the Environmental Protection Agency that the Secretary has complied with Environmental Protection Agency standards for the disposal of transuranic wastes pursuant to section 7(a)(2), if the Secretary determines that an operations performance demonstration is needed to support the demonstration and evaluation of the WIPP, the Secretary shall develop an operations performance plan in consultation with the Governor of the State of New Mexico, and the EEG. The operations performance plan shall specify the amount of waste needed to perform the operations demonstration and shall include procedures for the review of equipment and personnel performance, waste receipt and handling, and the application of quality assurance and quality control requirements.

## SEC. 7. COMPLIANCE WITH EPA STANDARDS.

(a) COMPLIANCE WITH EPA STANDARDS.—(1) From the date of enactment of this Act, the Secretary, with respect to the WIPP, shall be subject to Environmental Protection Agency management and storage standards that apply to transuranic waste, as those standards are in effect on the date of the enactment of this Act, or as amended after that date.

(2) Prior to the permanent disposal of transuranic waste at the WIPP—

(A) the Secretary, with respect to the WIPP, shall comply with the Environmental Protection Agency standards for disposal of transuranic wastes established pursuant to section 8; and

(B) the Secretary shall submit a statement of compliance with Environmental Protection Agency standards for disposal of transuranic wastes and necessary supporting documents to the Congress and the Environmental Protection Agency.

(b) LIMITATION ON TRANSURANIC WASTE.—Until the Secretary submits a statement to the Congress and the Environmental Protection Agency that the Secretary has complied with Environmental Protection Agency standards for disposal of transuranic wastes, the Secretary is limited in the amount of transuranic waste that can be emplaced in the WIPP facility to no more than that amount specified in the plans prepared under sections 5 and 6.

(c) ENGINEERED BARRIERS REQUIRED.—The WIPP shall use both engineered and natural barriers to isolate transuranic waste after disposal to the extent necessary to comply with Environmental Protection Agency standards for the disposal of the waste.

### SEC. 8. ESTABLISHMENT OF EPA STANDARDS.

(a) PROMULGATION AND ISSUANCE OF EPA STANDARDS.—The Administrator, pursuant to authority under other provisions of law, shall—

(1) issue revised proposed environmental standards for disposal of transuranic wastes no later than twelve months after the date of enactment of this Act; and

(2) issue final environmental standards for disposal of transuranic wastes not later than two years after the date of enactment of this Act.

(b) COMPLIANCE WITH FUTURE STANDARDS.—If the Administrator is ordered by a court of law to repromulgate or reissue the standards required under subsection (a) or is enjoined from implementing the standards or is otherwise prevented from giving the standards full force and effect by a court of law, the Secretary shall demonstrate compliance with the standards required under subsection (a) notwithstanding any court order to the contrary, unless the court order expressly finds and orders that its injunction relates to substantive health and safety aspects of the standards directly applicable to the WIPP.

(c) FAILURE TO PROMULGATE OR ISSUE.—If the Administrator fails to issue environmental standards for disposal of transuranic wastes pursuant to subsection (a), the Secretary shall demonstrate compliance with the environmental standards for the disposal of transuranic wastes as these regulations were in effect on November 18, 1985.

(d) COMPLIANCE WITH RCRA.—The Administrator, with respect to the WIPP, shall regulate as hazardous waste under subtitle C of the Solid Waste Disposal Act (42 U.S.C. 6921 et seq.) (commonly referred to as the Resource Conservation and Recovery Act) the hazardous component of all waste that is both hazardous and transuranic until the Administrator approves amendments to the State of New Mexico's hazardous waste program that authorize the State to regulate the hazardous component of waste that is both hazardous and transuranic.

### SEC. 9. ECONOMIC ASSISTANCE.

(a) WIPP-RELATED BUSINESS AND EMPLOYMENT OPPORTUNITIES.—To the maximum extent practicable, the Secretary shall continue to encourage business and employment opportunties related to the WIPP that may be conducive to the economy of the State of New Mexico, especially

Lea and Eddy countries, and report annually to the State of New Mexico on these activities.

(b) PAYMENTS EQUIVALENT TO TAXES.—There is authorized to be appropriated to the Secretary of Energy such sums as are necessary to provide a payment each fiscal year to the State of New Mexico and each unit of local government in which the Withdrawal is located. The payments shall be equal to the amount the State of New Mexico and the unit of local government would receive were they authorized to tax the development and operation of the WIPP, as the State of New Mexico and unit of local government tax the other real property and industrial activities occurring within the State of New Mexico and the unit of local government. The payments shall continue until all activities related to the development and operation of the WIPP are terminated at with WIPP site.

(c) POTASH LEASE.—The Secretary shall enter into negotiations relating to the mineral tract particularly described as Federal Potash Lease Numbered NM0384584, one thousand and six hundred acres of which lie within the Withdrawal, to arrive-at a just compensation for the holder of the lease of that tract. There is authorized to be appropriated to the Secretary such sums as are necessary to acquire these interests. Nothing in this section shall be construed to be a waiver of any judical remedies available to the owners of these interests or to the Secretary if an agreement cannot be reached on just compensation.

### SEC. 10. DECOMMISSIONING OF THE WIPP.

(a) PLAN FOR WIPP DECOMMISSIONING.—Within five years after the date of enactment of this Act, the Secretary shall submit to the Committees on Armed Services and Energy and Natural Resources of the United States Senate, the Committees on Armed Services, Energy and Commerce, and Interior and Insular Affairs of the United States House of Representatives, the State of New Mexico, the EEG, and the Administrator a plan for managing the WIPP after decommissioning. In addition to activities required under the Agreement for Consultation and Cooperation between the Department of Energy and the State of New Mexico, the plan shall be consistent with the standards for disposal of radioactive waste established by the Administrator that apply to the WIPP at the time the plan is prepared. The Secretary shall consult with the State of New Mexico and the Egg in the preparation of this Plan.

(b) Management Plan for the Withdrawal After Decommissioning.—Within five years after the date of enactment of this Act, the Secretary shall publish in the Federal Register a plan for the management and use of the Withdrawal following the decommissioning of the WIPP. The Secretary shall consult with the State of New Mexico and the EEG in the preparation of this plan.

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Senator **Bingaman**. Before we hear from the witnesses, let me just indicate that we do have quite a few witnesses this afternoon. I would urge that all witnesses summarize their testimony and try to do so in three to five minutes, and we will include the full testimony in the record.

Additionally, we will take other written testimony that people would like to submit for the record sometime in the next two weeks.

Before we go forward with any of the witnesses, let me defer to Senator Domenici, who has worked long and hard on this issue in this committee.

## STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

Senator **Domenici**. Thank you very much, Mr. Chairman.

Let me first tell you from the standpoint of the process here, and the witnesses, we do not have control of our own schedule up here, as I am sure Senator Bingaman has told you. The Chairman has a lot of problems today. At 3:15 we continue with the markup of the budget and start a vote.

I will try my best at 3:15 to go do that and come back if we are not finished, but Mr. Chairman, if I cannot be here much after that time, that is the reason.

I would like to put into perspective where I think we are. I have a more detailed statement that I would like you to make a part of the record, Mr. Chairman.

Senator **Bingaman**. We would be glad to do that.

Senator **Domenici**. I think it was three weeks ago when this committee held the first day of these hearings. I stated then that now is not the right time for Congress to consider land withdrawal legislation for WIPP because the Department of Energy has yet to complete a number of important tasks related to the protection of the public health and safety.

Since the first day of these hearings, DOE has not completed any of the health and safety tasks that I identified then and that I think were rather unanimously agreed upon. I am going to give a few "for instances", just in the event that they are relevant to any of the witnesses.

DOE still has not demonstrated that WIPP complies with the EPA standards for the storage of radioactive wastes; issued a final plan for the experiments at WIPP during the test phase; obtained approval of the final safety analysis report; determined whether to conduct an operations demonstration; acquired the remaining potash lease at the site; or prepared the safety and performance studies that the National Academy of Sciences, EPA and the Ahearne Committee had recommended.

Despite the fact that DOE has not completed the necessary health and safety tasks that I identified, after the hearing, DOE chose to submit a WIPP land withdrawal bill to Congress, which has now been introduced. Congress should not take any action on that or any other WIPP land withdrawal bill until DOE completes the health and safety tasks.

The DOE WIPP land withdrawal bill from this Senator's standpoint, considering everything that has happened in the last 18 months, is not only poorly timed, but is itself inadequate.

For instance, the DOE WIPP land withdrawal bill does not—and I hope some of the witnesses address these, I think they are very obvious deficiencies—does not require DOE to obtain EPA certification that the EPA disposal standards have been met.

DOE says they are going to meet those standards, but then the bill does not say that EPA will do the certifying, but rather that DOE will do that.

The bill also does not: subject DOE's decision on the Operation Demonstration to any independent approval; limit the amount of waste that can be brought to WIPP during the test phase; or direct DOE to conduct an annual demonstration of waste retrievability during the test phase.

We have all agreed, I think, Mr. Chairman, that from the early days of WIPP there should be a clear and unequivocal ban on high-level waste experiments. I do not think the DOE bill does that. It does not provide the $50 million for the State of New Mexico to offset the expenses of having WIPP in New Mexico.

There are many other deficiencies in the bill. Because the DOE bill will not adequately protect the health and safety of the people of New Mexico, I am opposed to it. I do not believe that that is the way we ought to do business.

I continue to be concerned about DOE's intention to fulfill its commitments to the State of New Mexico. I am not going to raise that issue today, other than to say that the highway funding was a commitment. It is not in the bill.

DOE must meet its commitment to support funding for the completion of these roads and bypasses because they committed to do that. This is the bill, S. 2420, Mr. Chairman, and I am disappointed that it does not do these things and that it was introduced and we are seriously considering it.

The witnesses today represent a broad spectrum of views on WIPP, but I think we all agree on one thing: we must place the safety of WIPP before all other considerations. And I think it is clear that WIPP will not open until it is safe.

I do not believe the adoption of this bill would do that. DOE has not completed the needed health and safety tasks. The DOE withdrawal bill is inadequate. And so I urge the Committee, since that is the subject of the hearing, not to take any action on the bill until we are much further along in completing these tasks.

Thank you very much, Mr. Chairman.

[The prepared statement of Senator Domenici follows:]

# STATEMENT OF SENATOR PETE V. DOMENICI

ON

THE SECRETARY OF ENERGY'S DECISION PLAN ON WIPP

AND

THE DEPARTMENT OF ENERGY'S PLANS TO SUBMIT WIPP LAND WITHDRAWAL LEGISLATION TO THE CONGRESS

COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

APRIL 26, 1990

Mr. Chairman, Three weeks ago, when this Committee held the first day of these hearings, I stated that the time was not right for Congress to consider land withdrawal legislation for WIPP because the Department of Energy had yet to complete a number of important tasks related to the protection of the public health and safety.

Since the first day of these hearings, DOE has not completed any of the health and safety tasks that I identified at that time. For instance, DOE still has not demonstrated that WIPP complies with EPA standards for the storage of radioactive waste, issued a final plan for experiments at WIPP during the Test Phase, obtained approval of the Final Safety Analysis Report, received final approval of the RCRA No-Migration Petition from EPA, determined whether to conduct an Operations Demonstration, characterized the WIPP waste, promulgated a retrieval plan for the WIPP waste, acquired the remaining potash lease at the site, or obtained State designation of the Preferred WIPP Transportation Routes.

Despite the fact that DOE had not completed necessary health and safety tasks, after the hearing DOE chose to submit a WIPP land withdrawal bill to Congress, which has now been introduced. I continue to believe that Congress should not take any action on a WIPP land withdrawal bill until DOE completes the health and safety tasks that I identified on April 3.

DOE's WIPP land withdrawal bill not only is poorly timed, it is wholly inadequate.

For instance, DOE's WIPP land withdrawal bill does not:

- o Require DOE to obtain EPA's certification that EPA's radioactive waste disposal standards have been met;
- o Subject DOE's decision to proceed with an Operations Demonstration at WIPP to any independent approval;
- o Limit the amount of waste that can be brought to WIPP during the Test Phase to that agreed to by independent scientists;
- o Direct DOE to conduct an annual demonstration of waste retrievability during the Test Phase;
- o Ban high-level waste experiments at WIPP; or
- o Provide $50 million to the State of New Mexico to offset the expense of having WIPP in New Mexico.

There are many more deficiencies in the DOE bill. I believe several of today's witnesses will describe the problems with the bill in detail.

Because the DOE WIPP land withdrawal bill will not adequately protect the health and safety of the people of New Mexico, I am inalterably opposed to this legislation.

I also continue to be concerned about DOE's intention to fulfill its commitments to the State of New Mexico regarding highway funding. DOE must meet its commitment to support funding for the completion of the WIPP road system and the construction of WIPP relief routes and bypasses. I am extremely disappointed that the land withdrawal bill that DOE submitted to Congress does not include an authorization for the relief routes and bypasses.

Mr. Chairman, we must place the safety of WIPP before all other considerations. WIPP should not open until it is safe. Because DOE has not completed all the necessary health and safety tasks at WIPP and DOE's proposed WIPP land withdrawal bill is woefully inadequate, I urge the Committee to take no further action on DOE's WIPP land withdrawal bill.

Senator **Bingaman**. Thank you very much.

Our first panel today is the representatives here from the Department of Energy's Blue Ribbon Panel, and the list I have been given is Dr. Tom Bahr, Dr. Arthur Kubo, Newal Squyres, Robert Bishop and Leonard Slosky. If they could please come forward at this time.

I understand you have an order that you have worked out among yourselves to make the presentations. Is that correct?

### STATEMENT OF DR. TOM BAHR, MEMBER, DEPARTMENT OF ENERGY'S BLUE RIBBON PANEL ON WIPP

Dr. **Bahr**. Thank you, Mr. Chairman. I will be the one to lead off. My name is Tom Bahr, and I am here today speaking as a member of the WIPP Blue Ribbon Panel. This panel was established back in August of 1989 as an independent oversight group.

I am also an employee or my permanent job is an employee at New Mexico State University, and I serve as director of the Water Resources Research Institute there. Previous to that, I spent two-and-a-half-years on leave from the university as the Cabinet Secretary for the Energy, Minerals and National Resources Department, and in that capacity served as Chairman of the Radioactive Waste Consultation Task Force, or commonly called the WIPP task force, which is the primary liaison between the executive branch of state government and the Department of Energy on a host of issues. We have dealt a lot with policy issues and to some extent technical issues.

My views on WIPP have in large part been shaped by that experience, but I guess it would be fair to say that I have gained in the last eight months considerably more information and insight into the WIPP project.

My views today are as an independent member of this panel. I do not speak for the university; I do not speak for the State of New Mexico.

I should stress that the Blue Ribbon Panel is not charged at arriving with a consensus on any particular issue. We have no chairman, and all of our comments, be they written or verbal to the Department of Energy, to the Secretary and his staff, are as individuals and not as a committee as a whole. So I think that is an important point to make.

Our specific charge is in my testimony for the record. I do not think I need to go through that in any detail. Suffice it to say that beginning in September of last year we had numerous interviews with Department of Energy personnel, others that related to WIPP. We have had numerous field trips. We have seen the WIPP site on more than one occasion, Rocky Flats, Idaho Engineering National Laboratory and so forth.

I think it is fair to say that we have probably interviewed, had dialogue and an opportunity to question virtually every individual that has had any managerial authority on WIPP. We have had a tremendous amount of interaction with WIPP managers.

Let me also add that in addition to my written comments, I would like to request, Mr. Chairman, that a report that was submitted by myself last October 23rd be made a part of the record.[1]

Senator BINGAMAN. We will include that in the record.

Dr. BAHR. Thank you.

At this point, Mr. Chairman, rather than getting in my specific observations in that report and then having each of the panel members go through and give their specific recommendations, I would like to kind of cut to the heart of this thing and really summarize the general observations of the panel to date.

And I think the first and most significant observation in my opinion is that on each and every issue that we have taken a look at, we have as individuals arrived at very similar conclusions, and these have been conclusions that are arrived at independently.

I think it is also noteworthy that there is a very high level of congruence between the findings that we have, our observations, and those of the Ahearne Committee and also in our interactions with the National Academy of Science WIPP Panel, we also find that our views are similar. So, let me highlight very quickly some of the items here that we do have general agreement on.

The first is that deep-bedded salt, the repository WIPP, appears to be a safe site for the long-term isolation of transuranic waste. It is certainly safer than where the waste is presently stored.

I think the feeling that in the undisturbed site, there is a high likelihood that WIPP would meet the long-term EPA standards for disposal, the undisturbed site. When one has to superimpose on this a human intrusion scenario, I think it is the feeling of individual members of the panel that that is going to be a much more difficult task.

Treating the waste to change the waste form, thereby forcing the repository environment into something that is a little more known in terms of condition, will significantly reduce the present uncertainties. And the most controllable variable that exists with the WIPP project is to control the waste form, and I think there is unanimity—I think there is at least independent consensus on that point.

Secondly, in situ testing in the mine itself is important and is necessary and should begin as soon as possible. The results of bin and alcove tests should significantly increase the confidence of the long-range projections that are currently being made and undertaken in the performance assessment. And individual members of the Blue Ribbon Panel agree that the quantity of waste in place for experimental purposes should be limited but should not be limited to preclude experiments that may be vital to generating information that will be used in the performance assessment.

A limit of approximately 1 percent of the waste capacity appears to be reasonable. A limit of .5 percent might be too restrictive from the standpoint that there may be additional engineered modifications that would be required or that should be tested in the actual WIPP facility underground. And this would be one of the later phases of the experimental program.

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[1] The report appears in Appendix III.

So .5 percent might not be enough to accommodate these additional experiments, but in any case the experiments, we feel, need to be justified in scientific detail.

Thirdly, the members of the panel conceptually agree with the EPA's suggestion that one ought to fill two full rooms and take a look at it over a period of time, conceptually we think it is an idea that is worth looking into.

This approach, however, should be evaluated in the context of verifying facility performance and not considered as part of the test phase. This is something that the Department of Energy has not asked the panel to look into at this time.

Fourth, on the subject of operations demonstration, our panel agrees that operations demonstration activities will generate valuable information, but I think we are in general agreement that a full ramping up of an operations demonstration should be postponed until such time as the final waste form and the repository configuration are determined and that there is a high level of certainty that Subpart B of 40 C.F.R. 191 could be complied with.

And last, number five, we are in general agreement as a panel that DOE has underestimated the complexity and level of effort required to comply with RCRA in managing its transuranic mixed waste.

So, Mr. Chairman, those are the high points. Those are the general areas of consensus, if you wish, that the panel has. Other panel members I am sure would be happy to elaborate on this, but in closing, I would simply like to say that we are very impressed by the responsiveness of the Department of Energy on a number of these suggestions that we have made.

Some examples are: first, significant improvements within the DOE organization toward overall system integration, so that one hand essentially knows what the other hand is doing. Secondly, I think you see a significant increase in effort being placed on evaluating engineered alternatives, or waste treatments if you wish.

Thirdly, we see an accelerated activity and seriousness on the part of DOE in dealing with RCRA issues, and last, we are pleased by the decision of the Secretary in the decision plan to postpone the start-up of the operations demonstration program.

So with that, Mr. Chairman, I thank you for the opportunity to testify, and I will stop at that point.

[The prepared statement of Dr. Bahr follows:]

# STATEMENT AND ACCOMPANYING DOCUMENTS OF

DR. TOM BAHR
MEMBER OF THE DEPARTMENT OF
ENERGY'S BLUE RIBBON PANEL ON WIPP

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

APRIL 26, 1990

My name is Dr. Tom Bahr and I am here today speaking as a member of the Waste Isolation Pilot Plant (WIPP) Blue Ribbon Panel. The Blue Ribbon Panel was established by the Secretary of Energy in August 1989 as an independent oversight group to provide advice on selected issues relating to WIPP.

I am presently an employee of New Mexico State University serving as Director of the New Mexico Water Resource Research Institute. Between 1987 and 1989, I spent 2 1/2 years on leave from the university serving in state government as Cabinet Secretary for the New Mexico Energy, Minerals and Natural Resources Department. As part of my responsibilities, I chaired the statutory Radioactive Waste Consultation Task Force, commonly called the WIPP Task Force. This Task Force serves as the primary liaison between the U. S. Department of Energy and the executive branch of state government in New Mexico. My work with the WIPP Task Force dealt largely with policy issues and to some extent technical matters within my personal area of expertise.

My views on WIPP have in part been shaped by that experience in state government, but to a lesser degree than the insights I have gained during the past 8 months as a member of the WIPP Blue Ribbon Panel. My remarks today are as an independent member of the Panel and they do not necessarily reflect the views of the State of New Mexico or New Mexico State University. I should stress that the Blue Ribbon Panel is not charged with arriving at consensus on any particular issue nor are we constituted as an official advisory body. We have no chairman and our written and verbal reports to the Secretary of Energy and his staff are done as individuals.

The original charge to members of the Blue Ribbon Panel was to analyze and report on three issues: 1) The concept and timing of DOE's proposed WIPP Operations Demonstration program; 2) Whether or not the Operations Demonstration program should be conducted in parallel with the Performance Assessment; and 3) An evaluation of DOE's validation plan for the certification of transuranic waste to meet the WIPP waste acceptance criteria.

During September and October of 1989, the Blue Ribbon Panel conducted site visits of the Waste Isolation Pilot Plant, Idaho National Engineering Laboratory and the Rocky Flats Plant. We were briefed by a host of DOE employees, contractors and others and we had the opportunity to question most decision-making managers having anything to do with the WIPP. We also reviewed thousands of pages of documents furnished by DOE and others. On October 23, 1989 we submitted individual reports to the Secretary of Energy. Mr. Chairman, I would like to request that my report be included for the record, if it is agreeable with the Committee.

Following the submission of our reports, the Blue Ribbon Panel was asked to continue its service to the DOE by providing our individual observations and recommendations to the Department in three areas: 1) continued review of DOE plans to characterize Rocky Flats Plant transuranic and mixed waste; 2) assist DOE in developing a strategy for achieving compliance with RCRA and other environmental regulations at WIPP; and 3) evaluate the Final Test Plan and ancillary documents. More recently, DOE expanded our charge to include a management review of the WIPP project, review of the rationale and plans to characterize waste for the test phase, review of plans for engineered alternatives relating to the waste form with the overall general focus being placed on an evaluation of DOE efforts on preparing for the test phase at the WIPP.

In addition to issues identified by the DOE, the Blue Ribbon Panel was also asked in late November 1989 to comment on questions submitted by members of the New Mexico Congressional Delegation. The questions were essentially two: 1) What is the rationale for conducting in-situ experiments at the WIPP rather than at existing waste generation and storage sites along with some discussion of how much waste would need to be emplaced at the WIPP for the experiments; and 2) Our recommendations regarding DOE's proposed )perational Demonstration experiments.

On December 28, 1989, I responded to these questions in writing to each member of the New Mexico Delegation. Two members of our Delegation who sit on this committee have seen my responses but for the benefit of others on this committee who may have not, the following were my answers:

*"1. Rationale and need for In Situ experiments at WIPP.*

*Experiments with actual transuranic waste being proposed by DOE to be conducted in situ at the WIPP range from small-scale bin tests to larger room-scale alcove tests. Bin experiments would be done in metal boxes containing assorted waste forms, brines and other additives, for the purpose of generating data on gas generation, biological and chemical reactions, etc. Alcove experiments would test the effects of actual room conditions on drums, backfill and seal performance, etc.*

*In my opinion, bin testing could be conducted elsewhere without significantly compromising test results so long as careful temperature control is maintained. To do so, however, would require facility construction and associated time delays. According to DOE, this could cost as much as $10 million. Alcove testing must be done in situ at WIPP to have any scientific credibility at all. The actual room conditions represent a complex set of interactions that simply cannot be duplicated elsewhere. Of particular significance are the interactions of gas pressure on brine inflow and the ultimate "wetness" of the room environment after closure. Alcove experiments over a 5-year period could generate valuable data on initial rates of these processes under real conditions and provide insight into physical, chemical and biological mechanisms that will affect long-term performance.*

*The DOE currently plans to emplace approximately 600 drum equivalents for bin tests and alcove testing would require close to 4,000 drums. The Blue Ribbon Panel has not been asked by DOE to make recommendations on the amount of waste needed for experimental purposes and we have not therefore evaluated that issue. I will say, however, that short-term health and safety concerns raised due to handling real transuranic waste during the experimental phase must be balanced against the knowledge gained by these experiments in making the facility safer in the long run. Put another way, DOE needs to find out as soon as possible whether there are design flaws* *that could compromise the long-term integrity of the repository so they can be corrected before waste is no longer retrievable.*

*It would appear prudent to increase rather than decrease the amount of waste experiments if one is looking for flaws in the final repository configuration. The U.S. EPA has already recommended that DOE significantly increase the amount of waste emplaced for experimental purposes to include filling two full-scale rooms. My general recommendation about the amount of waste to be used for experimental purposes is to error on the high side with hopes of gaining new knowledge to improve long-term safety than to error on the low side and stand the chance of overlooking an important design flaw. So long as the waste is retrievable and agreement is reached on where waste would ultimately go after it is retrieved (should it need to be), the amount of waste used for experimental purposes should not represent a major issue so long as the experiments provide meaningful information. I think it is safe to say that there is general agreement among the scientific community that performance assessment modeling is now seriously constrained by the lack of real experimental data. Levels of uncertainty with respect to understanding the interaction of brine inflow, gas generation and rates of various chemical and biological processes span several orders of magnitude. Experiments need to begin as soon as possible to significantly reduce this uncertainty.*

2. *My recommendations regarding Operations Demonstration.*

*My recommendation is that the full "ramp up" of the operations demonstration portion of the project should be delayed until test results better clarify the need for engineering modifications to the waste form or repository environment (see page 5 of my report). It is my personal opinion that in order for WIPP to satisfy long-term containment criteria, it will be necessary to incorporate some engineering modifications to the waste and/or room environment. Knowledge gained from carefully planned experiments can be used to identify the most appropriate blend of engineering modifications. These modifications would be used to force the chemistry, biology and*

> *physics of the repository to known conditions and thereby better assure long-term safety of the facility. In view of the fact that the final engineering configuration for the waste has yet to be determined, it does not seem reasonable to emplace waste drums in the WIPP for the purpose of gaining experience in drum handling when there is a significant chance the drums would have to be removed at a later date to be modified in one way or another.*
>
> *My view of Operations Demonstration is that it is not a scientific experiment but rather a gradual phase in of drum emplacement for ultimate disposal. Operations Demonstration is an essential component to full-scale operation of any complex facility. The entire waste handling complex including generator sites, transportation systems, emergency response and tracking systems along WIPP routes, performance of safety testing and waste handling at the WIPP site to the final emplacement of drums in rooms, backfilling and sealing are all elements of a comprehensive Operations Demonstration program. Quantitative performance criteria need to be developed for each element of the system and then tested as the disposal program phases in.*
>
> *In my opinion, valuable experience has already been gained and more will be gained during the experimental phase of WIPP. A full blown "ramp up" of an Operations Demonstration, however, must wait until such time as there is reasonable assurance that WIPP can comply with 40 CFR 191 Subpart B. That is not a scientific conclusion but rather a prudent management conclusion."*

At this point Mr. Chairman, rather than going into my specific observations and recommendations and then having each of the panel members do the same, we decided in order to save time that I would very briefly summarize the general observations of the panel to date. The first and most significant observation in my opinion is that each member of the Blue Ribbon Panel has independently arrived at similar conclusions on each of the issues we were asked to evaluate. Also noteworthy is the high level of congruence of our findings with those of the Advisory Committee on Nuclear Facility Safety (Ahearne Committee). We have also participated in meetings with the WIPP Panel of the National

Academy of Sciences and I can report that we also generally share the same views on those issues we have both looked into. Let me now highlight those items upon which members of the Blue Ribbon Panel seem to agree.

1. The deep bedded salt repository at the WIPP appears to be a safe site for long term isolation of transuranic waste; certainly safer than where this waste is presently stored. Radioactive releases over the long term for an undisturbed WIPP site will probably meet EPA standards (40 CFR 191 Subpart B). Meeting this standard having to consider human intrusion scenarios will be more difficult. Treating the waste so as to change the waste form and thereby force the repository environment to known conditions will significantly reduce present uncertainties. The most controllable variable in the design of the repository environment is the waste form.

2. *In situ* testing is important and necessary and should begin as soon as possible. Results of bin and alcove testing should significantly increase the confidence of long range predictions undertaken in the performance assessment. Individual members of the Blue Ribbon Panel agree that the quantity of waste emplaced for experimental purposes should not be limited such as to preclude justifiable experiments. A limit of approximately 1% of the WIPP waste capacity is reasonable. A limit of 0.5% may be too restrictive by precluding the opportunity to undertake important Phase III bin testing of different waste forms resulting from different engineered modifications.

3. Members of the Blue Ribbon Panel agree conceptually that the EPA suggestion of adding two filled rooms for monitoring purposes is worthy of further consideration by DOE. This approach, however, should be evaluated in the context of verifying facility performance and not considered as part of the test phase itself. We have not, however, been asked to evaluate EPA's suggestion.

4. On the subject of Operations Demonstration, our panel agrees that such an undertaking will provide valuable information because of the practical experience gained in system-wide operations. We are in general agreement, however, that a full

"ramping up" of an Operations Demonstration should be postponed until such time as the final waste form and repository configuration are determined and that there is a high level of certainty that the Subpart B standard can be met.

5. We also have general agreement that DOE had underestimated the complexity and level of effort required to comply with RCRA in managing its transuranic-mixed wastes.

Mr. Chairman, I have touched the high points and obviously skipped over many details. Other panel members may wish to elaborate on these and other items. In closing, there is one last item of strong agreement expressed by all panel members. We are very impressed by the responsiveness of DOE to our suggestions. Some examples include 1) The significant improvements that have been made in the DOE organization toward overall systems integration, both vertically and horizontally among the varied elements of transuranic and mixed-transuranic waste management; 2) The significant increase in effort being placed on evaluation of engineered alternatives and waste treatment; 3) The accelerated activity and seriousness with which DOE is now placing on dealing with RCRA and in particular on waste characterization issues; and finally 4) The decision by the Secretary to postpone the start up of the Operations Demonstration program.

Mr. Chairman, thank you for the opportunity to present testimony on this important subject.

Senator BINGAMAN. Thank you very much. Are there other members of the panel who wish to testify at this point?

Mr. BISHOP. Well, I think, Mr. Chairman, we have all got a little piece of it we thought it might be more efficient to address, and perhaps it might be more efficient to answer questions at the end at that point.

Senator BINGAMAN. That would be fine. Why do you not go ahead, Mr. Bishop.

## STATEMENT OF ROBERT W. BISHOP, MEMBER, DEPARTMENT OF ENERGY'S BLUE RIBBON PANEL ON WIPP

Mr. BISHOP. Yes, sir, thank you.

Mr. Chairman, Senator, my name is Robert Bishop. By way of quick background, I went back and calculated that I have been involved in nuclear power for 26 years now, dealing both in the commercial and in the Navy nuclear power plant part of it.

I also have the somewhat unique experience of being one of the only members of the panel to be, I guess, fairly classified in the situation of being a user. I was a weapons officer on a nuclear submarine. So I approach this from a variety of different perspectives.

As you consider the Department's decision plan and the readiness of WIPP in the context of legislative land withdrawal, as Dr. Bahr mentioned, I would commend to your attention my report and those of the other members of the panel.

I brought a copy of those reports, we all have, and made them available to the staff and we would like to have those included in the record with our written testimony.

In the interest of time, there is one point I would like to emphasize today. In our deliberations, and I know it came up in the Committee's April 3rd hearing, there were a number of questions about EPA standards, the focus being on WIPP's ability to meet those standards.

Because of my concerns in this area I went back prior to those hearings and reviewed the public record that underlies those regulatory provisions. Unfortunately, Mr. Chairman, Senator, the public record is clear: those standards were adopted for far different purposes.

They contain no technical evaluation of the properties and nature of transuranic or transuranic mixed waste or the unique characteristics of WIPP or the location that WIPP is located at.

They do not provide in my judgment a reasoned and responsible regulatory structure, appropriate to the disposal of transuranic wastes.

With respect to Part 268, EPA's codification of RCRA, I request that the record of this hearing include the letters that I referred to in my prepared testimony from Congressman Udall to NRC Chairman Carr, EPA Administrator Reilly and their responses concerning the need for prompt resolution of the mixed waste issue, and that certainly underlies a lot of our concerns about the WIPP facility and the waste to be disposed there.

As Drs. Rice and Fairhurst separately testified at this Committee's April 3rd hearing, EPA needs to ensure that it makes proper judgments based on justifiable assumptions in the development of standards and the application of those standards to WIPP.

The goal should be to ensure that the repository poses no significant health risks to the public. The goal should be uncritical, formal adherence to compliance with standards that are arbitrary.

As I stated in a recent letter to the Department regarding my concerns, appropriate environmental standards must be developed, and those standards must be based on a realistic assessment of public health risks.

Fundamentally, both DOE and EPA are responsible for implementing national policy, policy created by Congress, regarding the proper safe disposal of transuranic waste.

Neither agency can shrink their respective statutory responsibilities, but their responsibilities are joint and not several. DOE and EPA together must ensure in the context of the WIPP project that their responsibilities for safe permanent disposal of transuranic wastes are reconciled.

As EPA Assistant Administrator Clay testified at your April 3rd hearing, EPA is considering the Part 191 standards and expects to issue revised standards in draft form in late 1990.

I have urged DOE and I intend to continue to urge them to assist EPA in developing appropriate standards, rather than merely attempting to comply with whatever standards EPA develops. I think those are significant differences. Both 191 and part 268, as presently existing, contain provisions that allow DOE in a public, forthright manner, to provide pertinent data to EPA and for EPA to revise its generic standards as appropriate.

The potential risk to the environment 10,000 years from now must be balanced against the potential risk over the next 10 years and 100 years and 1,000 years. A failure to take decisive responsible action now to ensure that these wastes are properly disposed of is to decide to maintain the status quo ad infinitum, under which these wastes are packaged in thousands of 55 gallon drums in the open environment or in subsurface storage facilities at 10 different locations across the United States.

As I previously reported to Admiral Watkins, I do not believe that the current situation is unsafe, but I also do not believe that such de facto disposal is in consonance with the requirements that Congress established in the Atomic Energy Act to ensure that public health and safety is protected with respect to radiological hazards or those that Congress established in the Resource Conservation Recovery Act, that hazardous waste be treated and disposed of to minimize both present and future threats to human health and the environment.

Our responsibility to the present must not be discounted, and I urge DOE and EPA to diligently pursue development of appropriate standards. I also urge the passage of land withdrawal legislation so that when the Department has determined that it is safe and appropriate to do so, the test phase can begin. Only then can necessary in situ tests be conducted and necessary data developed so that informed judgments can be made about whether WIPP will be or will not be a suitable disposal facility.

Thank you, Mr. Chairman, and Senator Domenici.

[The prepared statement of Mr. Bishop follows:]

# TESTIMONY OF
# ROBERT W. BISHOP, ESQ.

MEMBER
U.S. DEPARTMENT OF ENERGY
WASTE ISOLATION PILOT PLANT BLUE RIBBON PANEL

BEFORE THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

April 26, 1990

## STATEMENT

Mr. Chairman and Members of the Committee, I welcome this opportunity to speak to you today. By way of background, I have been involved in various aspects of nuclear power for almost 26 years. That experience includes design, construction and operations of both naval nuclear propulsion plants and commercial nuclear power plants. I am here as a member of the U.S. Department of Energy's Waste Isolation Pilot Plant Blue Ribbon Panel.

The Blue Ribbon Panel is one of a number of oversight groups that have been created to assist the Department in identifying and resolving issues associated with the potential utilization of the WIPP facility as the Nation's research and development operation to validate the ability to dispose of radioactive wastes in a manner that would protect public health and safety as well as the environment. The Panel consists of five members: three members were nominated by the governors of Colorado, Idaho and New Mexico, and two members (including myself) were appointed by Admiral Watkins. The responsibility of the Panel members was to evaluate the information provided by DOE representatives, contractors and such other individuals and groups as each Panel member might determine appropriate, and to each submit an independent report to DOE of our individual conclusions and recommendations, which would then be used as input to DOE's decisions concerning WIPP activities.

The initial responsibility of the Panel was to evaluate the concept and timing of the WIPP Operations Demonstration Test Plan and to address the validation of the waste characterization at the Rocky Flats Plant.

Subsequently, the Blue Ribbon Panel was asked to continue in existence to complete its review of DOE plans to characterize transuranic wastes at the Rocky Flats Plant; to assist DOE in developing a strategy for achieving compliance with the Resource Conservation and Recovery Act ("RCRA") and other environmental regulations at WIPP, and to evaluate the final Test Plan and ancillary documents. Three weeks ago, we were also asked to provide continued management review of the WIPP Project (especially the revised Waste Acceptance Criteria), the plans for characterizing wastes for the Test Phase, and the engineered alternatives plan and associated activities. Fundamentally, our responsibility is to provide independent advice and counsel to DOE on various activities, including those that are necessary to satisfy the Department's Decision Plan requirements relating to the conduct of the Test Phase at WIPP.

My observations, conclusions and recommendations are contained in my report to Admiral Watkins dated October 23, 1989, and a supplemental report dated February 15, 1990, both of which I request be included in the record of this hearing. I would also ask that a copy of my responses to the questions posed by the members of the New Mexico Congressional Delegation at the end of last year also be included in the record.

My colleagues on the WIPP Blue Ribbon Panel have also documented their observations, concerns, and recommendations in our individual reports to the Department, as have the Advisory Committee on Nuclear Facility Safety and the National Research Council's WIPP Panel. I would commend those reports to the Committee's attention for the insight they might provide in more depth relating to the Committee's consideration of legislative land withdrawal or any further matters concerning WIPP.

In the eight months that the Blue Ribbon Panel has been in existence, significant changes have occurred in the WIPP Project. The most significant changes have been made in the areas of systems and task integration and in planning, which is best evidenced by the creation of the Draft Decision Plan which documents the major tasks that are necessary to support the Secretary's decision of when the Test Phase at WIPP will be able to commence.

I should emphasize throughout this process the Department has been very forthright in its dealings with the Panel and in supplying any information that has been requested. This process may have made their job more difficult, but I think there is no question that it has made the result significantly better. They are certainly to be commended for that view of their responsibilities, and for thoroughly considering the Panel Member's recommendations and taking actions responsive to many of those recommendations.

It is important to remember that the National Security and Military Applications of Nuclear Energy Authorization Act of 1980 authorized the WIPP facility "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission." In my judgment, and I believe it is consistent with the views of my fellow Blue Ribbon Panel Members and those of the Advisory Committee on Nuclear Facility Safety and the National Research Council's Management WIPP Panel, the Test Phase to be conducted at the WIPP facility, which involves in situ tests with actual transuranic ("TRU") wastes, is necessary and should begin promptly. The only way to determine if WIPP is a suitable research and development facility, consistent with the mission articulated by Congress in 1979, is to collect and evaluate data to reduce the uncertainties associated with assessing the facility's long-term performance. As Admiral Watkins and Mr. Duffy testified at the Committee's April 3, 1990 hearing, the only practical, reasonable and effective way to be able to assess whether WIPP is an appropriate disposal facility is to proceed with the Test Phase.

The Test Phase, to satisfy those objectives, must be flexible with respect to the number and type of experiments that will be conducted -- results of currently planned tests may indicate the need to conduct additional tests to resolve what may then be newly identified issues. The fundamental decision that DOE must make is how to gain the maximum experience, and therefore data, at the opportune time and with a minimum amount of waste. The waste volume to be used in the experiments should be as small as possible so that the cost, both economic and in terms of resources, of retrieval is as small as possible if it is subsequently determined that the waste must be repackaged, the waste form altered, or that the WIPP project is not viable. However, the waste volume must be large enough to ensure that appropriate data can be collected so that an informed decision can be made of whether WIPP is suitable to serve as an appropriate disposal facility.

The Admiral has stated that he intends to emplace no more waste during the Test Phase than is necessary, and my experience suggests that the Admiral honors his commitments. It is clear to me that DOE does not intend to use the Test Phase at WIPP as a subterfuge to alleviate the TRU mixed waste storage constraint imposed at the Rocky Flats Plant. To enact an arbitrary limit on the Test Phase that is too low, and thereby preclude the Test Phase from accomplishing its necessary objectives to provide data to enable informed judgments to be made about facility performance, would not be in the public interest.

It is also important to remember that DOE has committed to retrieving any waste emplaced in the Test Phase if the determination is made that WIPP is not suitable for service as a disposal facility. That retrievability plan was provided to the Blue Ribbon Panel for its review, and our comments and recommendations have been provided to DOE.

I do not believe that a numerical cap on the amount of waste to be emplaced in the Test Phase is necessary or desirable; setting an arbitrary limit may prove to be counterproductive to gathering data necessary to enable an informed decision to be made regarding the appropriate waste form and the facility and site suitability. However, if Congress determines that it should legislatively impose some numerical cap on the volume of waste that could be utilized to conduct the Test Phase, a reasonable level should be set (e.g., one percent) of total facility design volume to allow for the potential, and necessary, evolution of the tests and experiments to be conducted as part of the Test Phase, which may include the need to evaluate waste forms different from those that currently exist.

At the Committee's hearing on April 3, 1990, a number of questions were raised regarding the purpose and scope of the two rooms that EPA recommended that DOE establish for monitoring and subsequent evaluation. At the present time, DOE is evaluating the feasibility and value of creating those rooms, but it should be emphasized that the purpose of that proposal was to provide data over a period of many years to evaluate actual facility performance against expected facility performance. The purpose of that program is fundamentally different from the purpose of the Test Phase, which is to gather data to support the evaluations to be contained in the Performance Assessment to ascertain whether WIPP is a suitable disposal facility. Although the Blue Ribbon Panel has not evaluated this matter, I believe that EPA's suggested program might be an appropriate adjunct to the WIPP facility operation, but it should not be undertaken unless and until there is reasonable confidence as to the appropriate waste form for the TRU waste to be emplaced at WIPP and reasonable confidence that WIPP is a suitable disposal facility.

During the Blue Ribbon Panel's deliberations, and in fact during the Committee's hearing on April 3, 1990, questions continued to arise concerning the provisions and application of the EPA's "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" which is codified in 40 C.F.R. Part 191 Subparts A and B. Similar questions have also arisen concerning the applicability of provisions of the Resource Conservation and Recovery Act ("RCRA") and EPA's implementing regulations contained in 40 C.F.R. Part 268. Of particular pertinence at this time is DOE's submittal of a No-Migration Variance Petition under those regulations and EPA's recent announcement of its proposed decision on that submittal.

Because of the importance of these requirements and their application to WIPP, I reviewed the pertinent parts of the Nuclear Waste Policy Act, 40 C.F.R. Part 191, and that rule's associated Regulatory Impact Analysis and Draft Environmental Impact Statement. I also reviewed the applicable provisions of RCRA and the implementing regulations codified in 40 C.F.R. Part 268, as well as EPA's Notice of Proposed Decision on DOE's No-Migration Variance Petition of April 6, 1990.

Fundamentally, I am deeply troubled by the realization that EPA, at least as detailed in the critical documents in the public record that support the adoption of the current Part 191, did not consider TRU waste or the WIPP facility in the development of Part 191. Thus, Part 191 does not provide a reasoned and responsible regulatory structure appropriate to the disposal of TRU wastes. In addition, as currently drafted, those standards establish release limits and are not based on an evaluation of the risk to public health and safety. EPA has announced its intent to issue revised Part 191 regulations, with a proposed rule scheduled to be issued for comment late in 1990 and a final rule promulgated in mid-1992. The NRC's Advisory Committee on Nuclear Waste has committed to the NRC that it would provide specific recommendations to the NRC regarding appropriate revisions to the EPA standards as they relate to spent fuel and high-level waste. DOE should do nothing less with respect to TRU waste. I have recommended most strongly to DOE that it work with EPA, and the NRC as appropriate, and provide EPA with the technical justification that would support EPA's adoption of Part 191 standards appropriate to TRU waste and, as appropriate, the WIPP facility.

As a National Research Council's WIPP Panel observed in its 1989 report to DOE that Dr. Fairhurst referred to in this Committee's April 3, 1990 hearing, "[t]he primary goal of 40 C.F.R. 191 is to ensure that a repository poses no significant health risk to the public; standards set for compliance represent EPA's best estimate of what is required to achieve this goal. To date, however, these standards have never been applied to a specific repository." The Panel further stated that, "[t]he Panel believes that the above-mentioned primary goal can best be achieved by focusing performance assessment activities on demonstrating that the WIPP repository will be safe, i.e., pose no significant risk to public health and safety, rather than by an uncritical, formal adherence to compliance with the current EPA standard" (emphasis in original). I agree.

Dr. Rice testified at the Committee's hearing on April 3, 1990, regarding the concerns of the Advisory Committee on Nuclear Facility Safety about whether EPA has made proper judgments, based on justifiable assumptions, in its development of standards. The goal should not be to ascertain merely whether EPA standards are satisfied, but whether human health and the environment, consistent with the finding of Congress in RCRA, and the responsibilities delineated under the Atomic Energy Act, are being adequately protected both now and into the future. It appears self-evident that RCRA and

Part 191 were, by Congressional intent and EPA practice, based on concerns for materials and issues far different than TRU waste and TRU mixed waste.

I am also very concerned about the potential consequences of the regulatory duplication and conflict between EPA and NRC regulation of mixed wastes. I have provided for the record a copy of a letter from Congressman Udall to NRC Chairman Carr and EPA Administrator Reilly regarding the lack of resolution of the mixed waste issue and a copy of the responses of Messrs. Carr and Reilly. My specific concerns relate to the application of certain RCRA requirements to TRU mixed wastes, not only because of the current lack of regulatory resolution for the entire mixed waste issue, but also because of the very real occupational hazards that will likely result from slavish adherence to current RCRA requirements for hazardous material testing and identification that were developed for far different purposes and therefore are not appropriate in this situation. Workers should not be subjected to unnecessary occupational exposures to conduct waste testing if the test results will have no bearing on decisions related to facility performance and the experiments to be undertaken during the Test Phase to reduce the uncertainties associated with assessing facility performance.

As I emphasized in my October 1989 report to Admiral Watkins, both DOE and EPA are responsible for implementing national policy regarding the proper disposal of TRU waste. Neither agency can shirk its statutory responsibilities, but both must recognize that their responsibilities in this area are joint and not severable. DOE and EPA must ensure, in the context of the WIPP project, that the responsibility for safe, permanent disposal of TRU wastes and the requirements of Parts 191 and 268 are reconciled. It is not in the Nation's best interest for TRU waste, safe though it may be in temporary storage, to remain in that state ad infinitum because of a failure of governmental agencies to work together to develop a facility that can safely, permanently dispose of TRU wastes.

With respect to Congressional consideration of legislative land withdrawal, it should be emphasized that the experiments planned for the Test Phase are not required to demonstrate regulatory compliance, but rather to reduce uncertainties associated with the waste form and the response of the physical environment to the emplacement of those wastes. I strongly support the prompt passage of appropriate land withdrawal legislation so that the Test Phase, a necessary precondition to the determination of whether WIPP is a suitable disposal facility, can begin as soon as Admiral Watkins determines that it is appropriate to do so.

In conclusion, the WIPP facility appears to have been well-planned and constructed -- it has the hallmarks of a professionally designed and staffed facility. Even in the relatively short time in which the Blue Ribbon Panel has been active, it is clear that there are a great number of competent and motivated individuals, both professional and support staff, who are committed to doing their best to complete this project correctly. If WIPP is not determined to be a suitable facility as a geologic repository for transuranic waste, it does not appear that it will be for the lack of many individuals doing their best to do the job right.

In 1980, the President of the United States established a comprehensive program for the management of radioactive waste. In a message to Congress, President Carter observed that "[m]any citizens know and all must understand that this problem will be with us for many years. We must proceed steadily and with determination to resolve the remaining technical issues while ensuring full public participation and maintaining the full cooperation of all levels of government. We will act surely and without delay, but we will not compromise our technical or scientific standards out of haste. I look forward to working with the Congress and the states to implement this policy and build public confidence in the ability of the government to do what is required in this area to protect the health and safety of our citizens."

A decade has expired since that call to action was made, and its principles remain apt today. We must find the way to address and resolve these issues without delay, and continued Congressional support is required if those goals are to be able to be achieved.

Senator BINGAMAN. Thank you very much.

Dr. Kubo, did you——

Dr. KUBO. I have no remarks at this time.

Senator BINGAMAN. Mr. Slosky.

## STATEMENT OF LEONARD C. SLOSKY, MEMBER, DEPARTMENT OF ENERGY'S BLUE RIBBON PANEL ON WIPP

Mr. SLOSKY. I would like to proceed next. My name is Leonard Slosky. I am an environmental consultant from Denver, Colorado.

Senator BINGAMAN. If you might just pull that microphone up closer, if you would please. Thank you.

Mr. SLOSKY. I am pleased to have this opportunity to share my views on the WIPP decision plan with the Committee. I feel that progress in assessing the safety of WIPP cannot be made without data from the bin and alcove experiments using transuranic waste. Therefore, I believe that these experiments should begin as soon as all the prerequisites are met.

The bin experiments will be conducted in enclosed metal containers, isolated from the environment and thus can be conducted at WIPP or any suitable facility.

Unless unexpected delays occur, the bin experiments should be able to be started at WIPP as quickly or more quickly as at another location. However, if substantial delays occur in beginning the tests at WIPP, I believe that the bin tests should be conducted elsewhere. The essential thing is to start getting some data so we can move to the resolution of issues.

The alcove tests on the other hand can only be conducted at WIPP. This is because they are needed to study actions between the waste and the salt.

The bin and alcove tests are usually described as needed to determine the amount of gas that will be generated from the waste. It is important to understand that there are other critical issues that the experiments will address. A few of these are measuring the solubility of the radionuclides in the salt environment and assessing if gases from the waste will disperse into the salt formation.

Several issues have been identified that could delay the beginning of waste experiments at WIPP. There is one additional one that has not received much attention which I would like to discuss briefly.

That is the issue of waste characterization or better determining what is in the waste. There are two primary reasons why I think this is important. First is the fundamental scientific principle: if the initial conditions of an experiment such as the organic chemicals in the waste that go into the bin and alcove tests are not known, the results of the experiments may not be understandable.

Important issues are at stake here. For example, organic chemicals that may be present in the waste could greatly increase the solubility of plutonium in the waste and thus increase its mobility in the environment.

The second reason is that the waste to be used in the bin and alcove experiments must be representative of the total true waste inventory across the country. If the same types of wastes that will be disposed of in WIPP are not used in the experimental program, the experimental program may not have relevance to the actual performance of WIPP. Without more detailed analysis of the waste, it may not be known if the test wastes are indeed representative.

I do not think that the bin or alcove experiments should proceed before more accurate data on the nonradioactive chemicals in the wastes are obtained. Given the potential difficulties in getting these data, it is possible that this could delay the beginning of the tests until 1991.

We are expecting to see in the near future a plan from the Department to address this issue and hopefully it can be resolved soon.

Dr. Kubo will discuss the issue of waste form, or treating the waste, in more detail. However I want to stress that I have come to the conclusion that without such treatment, I feel we will be discussing these issues and they will remain unresolved for the remainder of this century.

It is also important to include in the bin and alcove tests the treated waste forms and other potential engineering alternatives. Therefore, I think that the 5 percent limit for the volume of waste in the experiments is a bit too low, and a limit of more like 1 percent would be appropriate.

I would like to observe in concluding that despite our tendency to dwell on the problems, I feel that WIPP fundamentally is a good site and can be made to work with the proper adjustments in the waste form.

Thank you.

[The prepared statement of Mr. Slosky follows:]

# STATEMENT OF

# LEONARD C. SLOSKY

MEMBER OF THE SECRETARY OF ENERGY'S

BLUE RIBBON PANEL ON THE

WASTE ISOLATION PILOT PLANT (WIPP)

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

APRIL 26, 1990

I am pleased to have this opportunity to share with the Senate Energy and Natural Resources Committee my views regarding the Decision Plan for the Waste Isolation Pilot Plant (WIPP).

My involvement with WIPP began in August 1989, when Governor Romer of Colorado and the Secretary of Energy asked me to serve on the WIPP Blue Ribbon Panel. After a very intense review, my initial report was presented to the Secretary on October 23, 1989. I have submitted a copy of that report for the record. Since that time I have provided the Secretary with several letter reports. The Blue Ribbon Panel is continuing to review and provide advice to the United States Department of Energy (DOE) on several aspects of WIPP. In addition to receiving many documents, the Blue Ribbon Panel generally meets and receives briefings every month or two.

### Progress in the Transuranic Waste Management Program

Since the fall of 1989, DOE has made considerable progress in the transuranic (TRU) waste management program. I am also pleased to report that DOE has been responsive to many of the recommendations of the Blue Ribbon Panel members. As a result of recommendations from the members of the Blue Ribbon Panel (and in some cases other groups as well) DOE has:

- Initiated the development of a headquarters-directed integrated TRU waste management system.
- Removed WIPP from the pressures of managing waste from the defense program's production facilities (i.e., Rocky Flats).
- Decided to postpone the "Operations Demonstration."
- Increased attention to the technical and regulatory issues relating to the hazardous chemicals in TRU wastes (particularly those regulated by the Resource Conservation and Recovery Act (RCRA)).
- Committed to publish periodically the results of performance assessment calculations.

- Began revising and expanding the WIPP waste acceptance criteria (WAC) and the procedures used to audit compliance with the WAC.

DOE has also made considerable progress toward completing the many actions needed to begin waste experiments at WIPP.

## WIPP Experimental Program

It is clear to me that further progress in determining whether or not WIPP is suitable for TRU waste disposal cannot be made without the bin and alcove experiments using real TRU wastes. The uncertainty in the predictions of how WIPP will perform cannot be substantially reduced without real world data. Therefore, the bin and alcove experiments should begin as soon as possible.

The bin experiments are to be conducted in enclosed metal containers isolated from the surrounding environment. Thus, the bin experiments can be conducted at WIPP or any suitable facility. Unless unexpected delays occur, the bin experiments could be initiated at WIPP as quickly or more quickly as another facility could be constructed and be in compliance with applicable legal requirements. However, if significant delays occur in initiating the experiments at WIPP, the bin experiments should be conducted elsewhere.

The alcove tests, on the other hand, can only be conducted at WIPP. Because the alcove experiments are needed to study the complex interactions between the wastes and the disposal environment (the Salado formation), they can only be conducted in the WIPP underground. While there has been much discussion of the quantity of gas that will be generated, there are other critical issues (i.e., the permeability of the Salado to gas) that the alcove experiments are designed to address. The alcove experiments also have the advantage of being close to the full-scale size of the disposal rooms. This means that the alcove tests will be more representative (than the bin tests) of the actual repository conditions, including utilizing a large number of waste packages that will be more typical of the radiological and chemical constituents in the large number of TRU waste types intended for disposal at WIPP.

## Waste Characterization

This hearing has addressed several issues that could delay the initiation of waste experiments at WIPP. A primary area that has been discussed (and which is largely beyond DOE's control) is the United States Environmental Protection Agency's (EPA) final decision of the No-Migration Petition. There is an additional area with which I am concerned that has received little public attention. This is the issue of waste characterization or composition. EPA's proposed Conditional No-Migration Variance requires DOE to submit results of detailed waste characterization and analysis of the wastes to be used in the bin and alcove experiments. In addition to this and other regulatory requirements for waste analysis (e.g., 40 CFR 264, the RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities), there are critical technical reasons why substantially more information is needed on waste composition.

Based upon a review of DOE's efforts to characterize the hazardous chemicals in the TRU wastes on the basis of "process knowledge," I have concluded that, at best, only semi-quantitative estimates are possible. Is it possible to develop reasonably reliable estimates of the quantities of hazardous chemicals in TRU wastes generated 15 years ago, based upon "process knowledge?" There are important reasons why reasonably accurate waste characterization data are needed.

The first is a fundamental scientific principle: If you do not know the initial conditions of an experiment (the hazardous chemicals that go into the bin and alcove tests), you may not be able to understand the results of the experiment. For example, certain organic chemicals that may be present in the TRU wastes (or may be produced by their decomposition) could greatly increase the solubility of the plutonium in the wastes. This is important because an increase in the solubility of plutonium could increase the mobility of the wastes in the environment.

The second reason is that the wastes to be used in the bin and alcove experiments must be representative of the universe of wastes to be disposed in WIPP. If you do not use the same types of wastes in the experiments that you intend to dispose at WIPP, the experiments may not be relevant to how WIPP will actually perform. There have already been substantial technical surprises in the WIPP program. The rooms have been found to close two to three times faster (at least initially) than originally estimated. The permeability of the salt has been less than estimated (resulting in the need for more accurate data on gas generation). At the conclusion of the several hundred million dollar WIPP test phase, it would be disappointing to discover that more detailed waste characterization information is needed.

Thus, based on my present understanding, I do not think that the bin or alcove experiments should proceed without reasonably accurate quantitative data on the organic chemicals in the TRU wastes. Given the potential technical difficulties in obtaining such data, it is possible that waste characterization could delay the initiation of waste experiments into 1991. A waste characterization plan is expected from DOE in the next several months. Hopefully there will soon be a solution to this problem.

The waste form or the need for waste treatment is a second issue that has not received much public attention. Based upon the review by the Blue Ribbon Panel and particularly from discussions with the National Academy of Sciences, I have concluded that the technical uncertainties regarding the performance of WIPP are considerable and are much greater than generally understood. For example, in modeling the long-term performance of WIPP, it is not unusual for the range of an input parameter to be four or six orders of magnitude. This means that for important measures of the properties of the Salado, the current state of knowledge is such that the actual number is somewhere between 1 and 10,000 or

1,000,000. Given the complexity of waste decomposition processes and interactions with the reconsolidating Salado formation, it is likely that at the end of a five-plus year experimental program, substantial uncertainties regarding the performance of WIPP will remain.

So what can be done to reduce these uncertainties? The salt is fundamentally a given. The design of the repository (e.g., the size of the rooms) can be changed, but such alterations are unlikely to enhance the performance of WIPP dramatically. Greater use of engineered barriers is possible, but their performance over 1,000 to 10,000 years is highly questionable. The one variable in the WIPP equation that is clearly changeable (i.e., can be dramatically improved) is the waste form. For example, waste treatment technologies are currently available that will essentially eliminate gas generation.

I believe that it is important to assess the likelihood of success by continuing to use an essentially untreated waste form versus producing a more stable waste form through treatment. In making this assessment it is important to consider the cost, timing, regulatory/institutional, and personnel exposure issues involved. While recognizing that waste treatment may be a substantial undertaking (depending upon the degree of treatment needed), I believe that it may be necessary to dispose permanently of TRU wastes in the foreseeable future.

Because of the potential importance of waste treatment to the performance of WIPP, a broad range of potential treated waste forms should be included in the bin and alcove experiment at the earliest possible time. I concur with the position of the Environmental Evaluation Group (EEG) that the test phase, in addition to quantifying gas generation, should include potential solutions to this problem. The DOE study of engineering alternatives that is now in progress is expected to address this issue.

### Quantity of Waste Needed for Experiments

I believe that DOE has justified the need for using waste volumes totaling about 0.5 percent of WIPP's capacity for the bin and alcove experiments. The Blue Ribbon Panel has not yet reviewed the EPA suggestion that DOE assess the technical feasibility of two large-scale instrumented rooms containing about 1.5 percent of WIPP's capacity. However, it seems advantageous to obtain the type of mid-term performance data intended to be provided by the EPA rooms. While such data are desirable, as EPA recognizes, obtaining these data may not be technically feasible. In any case, a decision on whether or not to include such rooms in the experimental program is at least several years away. It would not be prudent to begin such large-scale experiments until well into the test program when waste form and disposal configuration issues have been finally resolved. Otherwise, one risks having substantial quantities of waste in WIPP that have to be removed for treatment or disposal elsewhere.

Because of the importance of including treated waste forms (and other engineering alternatives) in the bin and alcove experiments, I would recommend that Congress authorize the use of waste volumes of up to 1.0 percent of WIPP's capacity for the bin and alcove experiments.

### Land Withdrawal Legislation

In my view it is preferable that the land withdrawal be done legislatively rather than administratively. Legislative land withdrawal has the advantages of being able to address the concerns of a number of interested parties as well as bolstering public confidence in the WIPP program.

The timing of land withdrawal legislation is also an important issue. I am hesitant to comment on this because it may be a "chicken or egg" problem depending on one's perspective. While everyone acknowledges that additional actions need to be completed before waste experiments can begin at WIPP, would it be in the national interest for the experiments to be significantly delayed while the current Congress is in recess or the 102nd Congress is in its start-up period? It would appear to me that Secretary Watkin's feet have been adequately singed by the fire. What substantive purpose would be served by holding the land withdrawal legislation "hostage?" DOE is now internally motivated to begin waste experiments at WIPP at the earliest possible time that they can be conducted safely and in compliance with all legal and institutional requirements. Is there any new information anticipated that would affect the provisions of the land withdrawal legislation? It would seem to me that Congress could now move to debate and resolve the remaining land withdrawal issues. The legislation could be passed through committee, and if deemed necessary, held for final passage until DOE satisfies Congress that it is ready to begin the experimental phase.

In conclusion, it is my observation that despite our focus on the problems of developing this nation's first permanent repository for TRU waste, bedded salt continues to be an outstanding medium for waste disposal and WIPP is a very good site. I know of nothing that indicates that WIPP has a "fatal flaw." While some type of waste treatment may be found to be necessary or expeditious, WIPP has a high probability of ultimately satisfying very stringent short-term and long-term health and environmental protection criteria. However, as a general matter, it should be recognized that there is inherent risk in any program that pursues a single approach without contingencies.

I will be pleased to respond to any questions.

Senator Bingaman. Thank you very much. Who is next?

Dr. Kubo, go right ahead. Is it Kubo? Am I pronouncing that correctly?

Dr. Kubo. Yes, sir.

## STATEMENT OF DR. ARTHUR S. KUBO, MEMBER, DEPARTMENT OF ENERGY'S BLUE RIBBON PANEL ON WIPP

Dr. Kubo. Mr. Chairman, I am Arthur Kubo, a nuclear engineer and waste technologist.

Senator Bingaman. Could you pull that microphone a little closer to you, please? Thank you.

Dr. Kubo. And I am a resident of Fairfax, Virginia. I am submitting for the record, copies of my panel report of October 23, 1989 and a letter to Senator Domenici addressing issues by the New Mexico congressional delegation.[2]

Similar letters were provided to you, Senator Bingaman, and Congressmen Skeen, Schiff and Richardson.

I would like to begin by concurring with what Dr. Bahr commented on. I endorse his comments about the general remarks of the panel.

I would like to talk about two issues. The first issue I would like to talk about is the WIPP test program. The second issue is waste form and performance predictability of the waste facility. Let me very quickly cover the first point.

There was some concern when we first began our review of the WIPP program that we were mixing the requirements to manage TRU and mixed TRU wastes with the technical demonstration of the facility. At this time, with the publication of the latest test program plan, it is clear that they have separated these issues, and if we proceed as we are, I feel that we will not have intertwined the two fundamental issues of managing wastes and proving the viability of the WIPP facility.

On the second point, I will read more in detail if you will permit me. There are two factors that significantly affect the long-term performance of WIPP as a deep geological nuclear repository. These factors are first the geologic and hydraulic site characterization of the site, and the second, the waste form characteristics.

It is very difficult to obtain reliable and valid site geologic data. Secondly, the current and projected waste inventory is heterogeneous and subject to regulation as both hazardous and radioactive waste. A significant portion of the inventory is mixed waste. It will generate gas and has an unpredictable brine solubility and permeability.

DOE may not be able to fully characterize either the facility, the site or the waste, no matter what extent they conduct their experiments. There will always remain a degree of uncertainty, and I am reiterating what Mr. Slosky said, and we will probably continue discussing this matter over the decade and probably into the next century.

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[2] The material, appears in Appendix III.

The waste form is one of the few items or variables that we can control, and I believe would significantly reduce the uncertainty of the WIPP facility.

Senator DOMENICI. Could you repeat that please, Doctor?

Dr. KUBO. What I am saying is that the waste form is one of the few parameters in the WIPP facility that we can control in the long term.

This uncertainty can be reduced by better defining the waste form. One is by characterization, and I will not go into that discussion. Mr. Slosky explained it quite well.

The other method of reducing the uncertainty is waste treatment. Modifying the waste form would reduce the leachability of the nuclides and preclude or reduce the gas generation phenomena common to the current waste forms and packaging.

This approach is technically more conservative and potentially more costly and could possibly delay the actual opening of the facility. However, this conservatism may be necessary to open WIPP as the first deep geologic repository of a national program to handle all the nuclear wastes.

At the present time, DOE is conducting an engineered alternative study to address these issues.

I would like to close my comments by saying the following. None of the technical issues that I have looked at or I have seen since I started the review of the program appear unsolvable, or, said another way, they are all technically solvable issues, but the tests and the experimental program must go forward to obtain the data.

WIPP was originally conceived as a test and demonstration facility. I can think of no better location to conduct the realistic performance assessment tests than at WIPP itself.

Thank you, Mr. Chairman, for permitting me to testify.

[The prepared statement of Dr. Kubo follows:]

STATEMENT OF

Dr. ARTHUR S. KUBO

PANEL MEMBER

# THE SECRETARY OF ENERGY'S WASTE ISOLATION PILOT PLANT BLUE RIBBON PANEL

BEFORE THE

# COMMITTEE ON ENERGY AND NATURAL RESOURCES

# UNITED STATES SENATE

APRIL 26, 1990

I am Dr. Arthur S. Kubo and am pleased to appear before you today as a member of the Secretary of Energy's Waste Isolation Pilot Plant (WIPP) Blue Ribbon Panel to discuss the Department of Energy's (DOE) proposed legislation entitled the "Waste Isolation Pilot Plant Land Withdrawal Act."

I submit for the record copies of my Panel Report of October 23, 1989 and a letter provided to Senator Domenici addressing issues raised by the New Mexico Congressional Delegation. Similar letters were provided to Senator Bingaman, and Congressmen Skeen, Schiff and Richardson.

To begin with, I endorse Dr. Tom Bahr's Introductory Remarks on behalf of the Blue Ribbon Panel and reiterate the importance of proceeding with the needed experimental program as part of the assessment of the long term safety of WIPP. My further remarks will emphasize two points:

1. The WIPP Test Program now focuses on demonstrating the technical feasibility of the WIPP concept and is separate from the operational management of TRU/Mixed TRU waste, and

2. A well understood and predictable waste form reduces the uncertainty in assessing the long-term safety performance of WIPP.

**A. WIPP PROOF OF CONCEPT:** In my report of October 23, I commented that the WIPP Program was attempting to address three major national issues: demonstrating the technical soundness of the WIPP concept, evolving a workable set of mixed waste regulations, and supporting the defense nuclear materials waste management program. I recommended, along with others, that the WIPP Test Program should focus on the technical feasibility of WIPP and be separated from the DOE's operational TRU waste management program. The Performance Assessment Experiments are designed to provide the technical data to reduce the uncertainty in assessing the long-term safety performance of the waste repository. This goal should not be intertwined with the need to manage TRU/Mixed TRU waste generated by the defense nuclear weapons production program.

The more realistic the Test Program the less likely we will be confronted with future surprises. Although the bin tests can be conducted off-site with further delay and additional cost, the most realistic test bed for the WIPP experiments is underground at WIPP. The research and development program must first demonstrate that WIPP is a safe Mixed TRU waste disposal facility. DOE is focusing the test program on obtaining the scientific data necessary to support a WIPP technical feasibility assessment in the near future and has separated it from the defense nuclear weapons production waste management program.

**B. WASTE FORM:** There are two factors that significantly affect the long-term performance of the WIPP as a deep geologic nuclear waste repository. These factors are (a) the geologic and hydraulic characteristics of the site and (b) the waste form characteristics. Obtaining and interpreting valid geologic and hydraulic data is difficult. The current and projected waste inventory is heterogeneous and subject to regulation as both radioactive and hazardous waste. A significant portion of the inventory is mixed waste, will generate gas, and has an unpredictable brine solubility and permeability. DOE may be unable to fully characterize, regardless of the extent of their experiments and tests at WIPP, the site geology and hydrology, and the TRU waste inventory. There will always remain a degree of uncertainty in assessing the long term repository performance. The waste form is one of the few variables we can control that significantly reduces the uncertainty of future WIPP performance.

This uncertainty can be reduced by better defining the waste forms that are proposed for burial. One method of better defining the waste forms is by accomplishing waste characterization studies. DOE currently is developing plans to accomplish this. DOE will be technically ready to begin the bin and alcove tests on-site when they have appropriately characterized the test waste and developed a plan to characterize the current and projected waste inventory.

Waste treatment is an alternative method to control the waste and packaging characteristics to fix the disposal site environment. Modifying the waste form would reduce the leachability of radionuclides on the off chance of repository disruption and preclude or reduce the gas generation phenomenon common to the current waste forms and packaging. This approach is technically more conservative and potentially more costly; however, this conservatism may be necessary to open WIPP as the first deep geologic repository of a National Program to safely dispose of all nuclear waste. DOE is currently conducting a study of Engineered Alternatives that addresses these issues.

In conclusion, the WIPP technical issues are all solvable, but the test and experimental program must go forward to obtain the data necessary to assess long term safety. WIPP was originally conceived as a test and demonstration facility. I can think of no better location to conduct realistic performance assessment testing than at WIPP.

Senator **Bingaman**. Thank you very much.

Mr. Squyres, you have not had a chance yet. Go right ahead.

### STATEMENT OF NEWAL SQUYRES, MEMBER, DEPARTMENT OF ENERGY'S BLUE RIBBON PANEL ON WIPP

Mr. **Squyres**. Mr. Chairman, I am Newal Squyres from Boise, Idaho. Thank you for the opportunity to present testimony here today. I will try to keep it short, as I think we are probably pressing up against our time.

To put the issue in perspective of what we are talking about in terms of the test phase, I think it is important to remember several things. First, WIPP's total capacity is 880,000 drum equivalents of TRU or mixed TRU waste.

The test phase that we are talking about is they are going to use about 4,500 drum equivalents of waste, and there are 280,000 drum equivalents of this waste stored, and I would have to say, quote, "temporarily" at sites throughout the United States, and there are 180,000 of these drums stored temporarily in Idaho.

So we are really dealing with a very small percentage of the waste to be used for the test phase as compared to the waste that exists and has already been produced.

So we have got two problems really. You have the problem with dealing with what is currently stored temporarily and what will go forward in the future.

At the first meeting of the Blue Ribbon Panel in Albuquerque, New Mexico on September 11th, 1989, the representative from the National Academy of Sciences said there were no significant safety issues associated with using WIPP for the test phase.

As far as I know, that still holds true today, and a lot of the hurdles that existed last September in terms of institutional and regulatory concerns have been overcome. I believe the most significant hurdle remaining to beginning the test phase is land withdrawal legislation, and I support DOE's effort to obtain appropriate land withdrawal legislation during this term of Congress so that the test phase can go forward.

As the number of groups who are testifying here today illustrates, there are a lot of independent oversight groups looking over DOE's shoulder in this process. I think DOE is doing a good job of responding to those groups and that we have the opportunity to accomplish something here.

As the closing speaker, I want to reemphasize the opening remarks of Dr. Tom Bahr of New Mexico, that talk about the areas where almost everyone who looks at this project agrees.

One, it is in the national interest to do something about this problem we have. WIPP is safe from the standpoint of being ready to proceed with the test phase. The operations demonstration should be separated from the test phase, and this has been done. The test phase should be conducted at WIPP.

DOE should continue to fully explore the waste form and other engineering modifications. And I think the quantity of waste for the test phase, there has to be some flexibility there. Personally I think you could establish an upper limit of 1 percent and that would probably permit the flexibility and the 1.5 percent for the rooms that the EPA has suggested is something that should be studied but is probably a separate issue.

In closing, I have not heard anyone suggest in the last eight months that there is a better place to store or dispose of the waste in question than WIPP. The taxpayers have spent over $800 million for the facility, and there appears to me to be no sound reason not to put WIPP to its intended use as a research and development facility.

It is a mistake I believe not to recognize that WIPP is a unique place and that its potential to provide a meaningful solution to some of this Nation's waste management problems is an outstanding accomplishment. And it would be a sad day indeed if we do not seize the opportunity to go forward with WIPP's development.

Thank you, Mr. Chairman, for the opportunity of presenting testimony here today.

[The prepared statement of Mr. Squyres follows:]

# STATEMENT OF

# NEWAL SQUYRES

# MEMBER

# DEPARTMENT OF ENERGY'S

# BLUE RIBBON PANEL ON WIPP

# BEFORE THE

# COMMITTEE ON ENERGY AND NATURAL RESOURCES

# UNITED STATES SENATE

April 26, 1990

## STATEMENT

Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear before you with the other members of the Secretary of Energy's Blue Ribbon Panel on the Waste Isolation Pilot Plant (WIPP). I practice law in Boise, Idaho, and became a member of this group as a result of Admiral Watkins' request of Governor Cecil Andrus to nominate someone from Idaho to serve on this Panel. My views on WIPP are my own and do not necessarily represent the views of Governor Andrus or the State of Idaho. Initially, the five members of the Panel were each asked to provide an independent assessment of certain issues related to WIPP, involving primarily the scope and direction of the test phase. My report to the Secretary of Energy was submitted on October 23, 1989, and will be submitted to the Committee for the record as an addendum to this prepared statement. That report, although somewhat dated by subsequent events and the Panel's continuing involvement on certain issues, continues to reflect my overall views on WIPP.

Congress established WIPP's mission in 1980, when it directed the Secretary of Energy to proceed with construction "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States . . . ." Pub. L. No. 96-164, § 213(a) (1980). To put this mission in perspective in terms of the test phase now at issue, it is important to remember several things. WIPP's total capacity is 880,000 drum equivalents of TRU and/or mixed-TRU waste. The test phase as currently configured contemplates the use of approximately 4,500 drum equivalents. There are over 280,000 drum equivalents of this waste stored "temporarily" at sites throughout the United States in facilities not designed or intended for permanent disposal. There are approximately 180,000 drums in temporary storage in Idaho planned for shipment to WIPP.

DOE has made significant progress in the last eight months in moving WIPP from the construction phase to the experimental phase of its development. This test phase is necessary to aid in establishing regulatory compliance and, more importantly, to determine whether, or under what conditions, WIPP may serve as a permanent repository for the disposal of defense generated TRU and mixed-TRU waste.

At the first meeting of the Blue Ribbon Panel in Albuquerque, New Mexico, on September 11, 1989, the representative from the National Academy of Sciences (NAS) said there were no significant safety issues associated with using WIPP for the test phase. At that time, however, there were institutional and regulatory matters that had to be resolved before the test phase could begin. Technical issues related to the scientific experiments for the test phase were also still being addressed.

Resolution of these outstanding issues has followed in a steady progression since the Secretary's draft decision plan for

WIPP was issued last October. My understanding is that WIPP is very close to being operationally ready to receive the limited amount of waste necessary to begin the test phase. The EPA's decision earlier this month on DOE's no migration petition provides the opportunity to satisfy critical regulatory requirements under RCRA. The proposed conditional variance would allow DOE to place untreated mixed waste into WIPP for the purpose of testing and experimentation. The public comment period is now underway, and EPA contemplates being in a position to finalize its proposed variance by September of this year. I believe the most significant remaining hurdle to beginning the test phase is the land withdrawal legislation now under consideration by this committee. I strongly support DOE's effort to obtain appropriate land withdrawal legislation during this term of Congress so that the test phase can begin as soon as possible.

There is another consideration which should not go unnoticed as decisions are made concerning WIPP's future. There are a number of independent oversight groups, not to mention federal and state regulatory agencies, involved in the decisionmaking process. The presence of these groups provides substantial assurance of adequate peer review for the scientific and technical issues and will prevent decisions from being hidden or being made in a vacuum. I have been continually impressed by DOE's willingness to accept and respond to suggestions and criticism from these independent groups.

As the closing speaker, I want to emphasize the opening remarks of Dr. Tom Bahr from New Mexico. Although there has been no effort by the members of this Panel to arrive at agreement on the subjects we have considered, agreement has naturally evolved from our independent evaluation of the issues. Moreover, our conclusions on the primary issues have been in accord with the other groups providing advice on various aspects of WIPP. This is significant when one considers the differences in background, training and experience of the individual members of these groups. In my judgment, those areas of agreement are as follows:

- It is in the national interest to safely manage the disposal of the waste (existing and future) generated by the production of nuclear weapons.
- WIPP is safe from the standpoint of being ready to proceed with the test phase.
- The operations demonstration should not begin until enough data is gathered from the test phase to indicate with some assurance what the final disposal methods will be.
- The test phase should be conducted at WIPP.
- DOE should continue to fully explore changes in waste form and other engineering modifications.
- The quantity of waste for the test phase should permit flexibility to expand the currently proposed experiments with additional waste, if scientifically justified.

I have not heard anyone suggest in the last eight months that there is a better place to store or dispose of the waste in question than WIPP. The taxpayers have spent over $800 million for WIPP, and there appears to be no sound reason not to put WIPP to its intended use as a research and development facility. It is a mistake not to recognize that WIPP is a unique place and that its potential to provide a meaningful solution to some of this nation's waste management problems is an outstanding accomplishment. It would be a sad day indeed if we do not seize the opportunity to go forward with WIPP's development.

Thank you for the opportunity of appearing before you today; I would be pleased to attempt to answer any questions you might have.

Senator BINGAMAN. Thank you very much.

I will start with a few questions. I guess I will address these—the first one, at any rate, to Dr. Bahr. With regard to EPA's suggestions of adding an additional 1.5 percent for these two rooms, your statement says, "This approach should be evaluated in the context of verifying facility performance, not considered part of the test phase itself."

Now, what I understood EPA to say when they were here at our earlier hearing was they really intended that suggestion to be something which would take place as they continued to monitor performance. Once the EPA standards had been met and WIPP was functioning as a repository, they did not intend, at least as a first choice, that an additional 1.5 percent would go to the site at the same time the .5 percent went to the site.

From what I read in your statement and what I heard you say, you agree with that basic characterization. We do not need that extra 1.5 percent now, is that right?

Dr. BAHR. That is correct, Mr. Chairman.

Senator BINGAMAN. And that is the view of the panel generally?

Dr. BAHR. Yes, sir.

Senator BINGAMAN. And you have not really been asked by DOE to look at that issue as a panel? That was not one of the issues put before you, was it?

Dr. BAHR. No.

Senator BINGAMAN. I guess I am still a little unsure on the statements which have been made that the .5 ought to be made 1 percent because there may be some need for some additional flexibility.

I remember several years ago watching a 60 Minutes program where they had a crime boss there and they asked him whether he paid his taxes and he said not only do I pay my taxes, I always send a little bit extra just in case there is a mistake.

This sounds a little like that. Have you identified a need for more than the .5 percent?

Dr. BAHR. Mr. Chairman, I think the half a percent—.5 percent needs clarification. That is the amount of waste that has been identified for the experiments that do not include any of the treated waste forms. That is the half of percent. If one is to go in and do additional experimentation, the phase 3, if you wish, of the test phase, taking waste that has been treated in various forms and testing it, the .5 percent does not include that.

I think the—my personal opinion is I do not believe it is prudent to preempt valid experiments that may be coming along later on, and I think that additional leeway of up to 1 percent would accommodate the phase 3 experiments for looking at different waste forms.

Senator BINGAMAN. So you see the need for that additional .5 percent being based on the possibility that they would take treated waste to the site. Is that right?

Dr. BAHR. For experimental purposes, that is correct.

Senator BINGAMAN. For experimental purposes, but based on the plans they now have to take waste to the site, the .5 is adequate, is that right?

Dr. BAHR. That is my understanding, Mr. Chairman.

Senator **Bingaman**. Is that consistent with everybody else on the panel?

Dr. **Bahr**. Yes.

Senator **Bingaman**. Let me just ask about the need to do this at the site versus the possibility of doing it elsewhere. I think, Mr. Slosky, you testified that you felt that the bin experiments could be done elsewhere and could be started immediately or very soon. Is that right or did I misunderstand you?

Mr. **Slosky**. Let me clarify, from a technical standpoint, I think the experiments can be done in any suitable facility. The problem is what suitable facility can be brought on line quickest? Is it WIPP or it is a new facility? I think that is the decision at hand.

It seems to me that if WIPP is going to be available in the relatively near future and faster than another facility, there is no reason to pursue another facility.

Senator **Bingaman**. But you do not identify a scientific reason why those bin experiments need to be done at the site?

Mr. **Slosky**. No, I do not believe there is a scientific reason.

Senator **Bingaman**. Now, the alcove experiments are different? There is a scientific reason why those need to be done at the site, as I understand your statement.

Mr. **Slosky**. Yes, the fundamental purpose of the alcove experiments is to study the interactions between the waste and the site, so it is essential that they be done at the site. I guess theoretically you could extract enough salt from WIPP, move it someplace else and reconstruct a WIPP prototype, but that does not seem to make much sense.

What you really need to do is to put the waste into the site because you want to study the interactions with the site.

Senator **Bingaman**. Is there a way to differentiate the amount of waste involved in the alcoves versus the bin experiments or has that not been done?

Mr. **Slosky**. Yes, DOE has broken that down in the latest test plan. My recollection is it is about 600 drum equivalents for the bin tests and the balance of 3,300 some is for the alcove tests.

Senator **Bingaman**. 3,900?

Mr. **Slosky**. Yes.

Senator **Bingaman**. 3,900, because I had heard or I had understood 4,500 drums for the whole .5 percent.

Mr. **Slosky**. Yes.

Senator **Bingaman**. Is Mr. Slosky's view on that shared by the rest of the panel?

Let me ask on this other issue which has come up here and it came up in our earlier hearing as well and that is this question of whether DOE is doing all it should right now to modify or to determine whether it needs to treat this waste or do something to change it.

I asked Secretary Watkins and Mr. Duffy in the last hearing when they were going to know whether they need to modify this waste before they can put it in the site on a permanent basis, and Mr. Duffy's testimony was sometime three years from now to five years from now we will know that.

I guess my concern is, your testimony, particularly Dr. Kubo's testimony, seems to me to say fairly strongly that that may well be required before we can actually use this site. Is that what you said?

Dr. KUBO. Let me clarify what I am trying to say. There is a lot of uncertainty in all your calculations at this point and even in the future, and one of the ways to reduce the uncertainty is——

Senator BINGAMAN. Could you pull that microphone up a little?

Dr. KUBO. One of the ways to reduce the uncertainty is to treat the waste. The concern we are expressing is, if you do this serially so that you approach your decision points sequentially, when you find something does not work or it is too uncertain, we could be into the next century making the argument should we or should we not treat the wastes.

The point I am making now is the treating of the waste will reduce significantly the uncertainty of assessing the in situ environment at the facility over the long period of time you anticipate the waste to have to remain there, and the point I am making is it should be done concurrently.

Now let me go back and answer one question that you had asked. Does .5 percent of the waste inventory represent a reasonably valid experiment? If we are going to look at modifying waste forms, I will reiterate what Dr. Bahr said, the current .5 percent includes no experiments in phase 3 of the bin tests which would look at the engineered alternatives.

So in essence, .5 percent does not include an exhaustive look at alternate waste forms.

Senator BINGAMAN. I guess here is what I am trying to get at and maybe this is what you are trying to get at as well. If in fact the decision will be made sometime down the road, or may be made sometime down the road, that we need to treat or modify this waste in order to meet the safety standards that we have set for ourselves, if that decision may be made down the road, at that point we are going to have to design and construct and do a lot of things with a separate facility to accomplish that treatment and modification.

The plan right now is that this facility, if everything worked properly, according to the Department of Energy, this facility might be ready to be used as a repository by the middle of 1994.

But you are saying that if they go in the order they are now planning to, that time frame might not be realistic because they might find three to five years from now that they want to go and treat or modify the waste.

So then we will have another few years, and we enjoy having these hearings, but there might be a way to shorten this thing down a little and make the decisions earlier. Is that what you are saying?

Dr. KUBO. Yes, you are more perceptive than my answer, that is what I was saying. The whole point of it is, if we wait around until three years from now, then we have to design the facility, license the facility, do the experiments at that facility to treat the waste.

Senator BINGAMAN. And you believe DOE could move to make that decision on whether to treat the waste more quickly than they are presently planning to?

Dr. KUBO. That is correct.

Senator BINGAMAN. Okay.

Mr. BISHOP. Mr. Chairman, may I? Just a quick postscript. It may turn out that the waste within the .5 percent limit demonstrates that the facility can perform adequately to assure public health and safety is protected. But that is putting all the eggs in the same basket if you do not, in roughly the same time frame, start to evaluate other alternate waste forms that may increase—decrease the uncertainty, increase the likelihood that the facility will perform correctly.

You could wait until all of the test data is in and then make that decision or you could look at likely alternatives now and run these paths in parallel so you can get to the end result, a decision about whether WIPP is suitable, a decision about suitable with what waste form at a sooner point in time.

Senator BINGAMAN. Thank you very much. Did you wish to add something?

Mr. SQUYRES. I was going to add that treating the waste form is not a reason not to begin the test phase, that is not—we are not saying, do not begin the test phase until you decide whether you are going to treat the waste form or not. We are saying run those things in parallel and let us begin the test phase, but let us emphasize a possible modification in the waste form.

Senator MCCLURE. Could the record note that there were some nods up and down the——

Senator BINGAMAN. Yes. Does everybody agree with that? If anybody disagrees with anything any of the rest of you say, I hope you will speak up, because we are assuming that you all are unanimous on all subjects.

Senator Domenici.

Senator DOMENICI. Thank you very much, Mr. Chairman.

Let me share with the five of you, only one of whom is from New Mexico, the frustration that I have. First of all, I am not a scientist like most of you. You are not all scientists, but I am not an expert in nuclear matters like most of you, but I do represent people who tend in a state like New Mexico to be very reasonable and rational.

Frankly, I have changed my mind about keeping the pressure on DOE because I never saw anything like a decision plan for WIPP—you all have seen that now, have you not? I never saw anything like that before. Mr. Chairman, you were working on this as attorney general when I was working on it as a senator. I have been on this from the first closed hearing that Senator Jackson called when they were never going to let anybody know in the whole world that they were going to put defense waste at WIPP.

Can you imagine? This was going to be done. That is how far back I go. I think that is maybe how it got its name, "isolation," although that was a science term.

In any event, you see, because a governor, I think illegally, said you are not going to send anymore waste to his state—and that was not New Mexico——

Senator MCCLURE. What state was it?

Senator DOMENICI. That was the state—[Laughter.]

Mr. SQUYRES. The great State of Idaho.

Senator DOMENICI. The great State of Idaho, I might indicate, the state that the distinguished witness over there on the extreme right—[Laughter]—who seemed to be the most upbeat about getting on with WIPP, comes from. He almost had a smile and a glee in his eye.

But in any event, let me say, you see some governor illegally said, you are not going to move any more and this decision plan got produced. I hear from some of you that it is going to take a long, long time under the best of circumstances to determine whether WIPP is a permanent depository that meets standards. I do not read that wrong, do I? Is it going to take a number of years, it is not?

And during that number of years, this little tiny bit of experimental waste, if we do it, is not going to alleviate the need for substantial additions to the temporary storage capability in this country, is it?

Mr. SLOSKY. That is right.

Senator DOMENICI. Now what worries me is that there is a big misconception growing that if you withdraw the land, you know, everybody can pull back and we are on our way to a solution. So if you wonder why this senator is saying, "Hold it, when we have almost every one of the science things that have been committed to us, then we can withdraw the land," it is because I believe that the land withdrawal bill has become symbolic of the problem solved, and I do not believe that is the case at all.

So I do not agree with the five of you that we ought to get on with the land withdrawal bill, even though at one point before I had states around us saying open WIPP, send us no more waste, I might have said, let us withdraw the land and put 40 conditions in.

It took something like that to get a decision plan and maybe it was a new Secretary.

So I am still skeptical and I want to get as many things done as possible, knowing full well that this a research facility.

Now having said that, let me just give you one. Mr. Slosky, you indicated that waste characterization was extremely important, did you not?

Mr. SLOSKY. Yes.

Senator DOMENICI. Now, it is right here on this decision plan, and everyone is urging land withdrawal bill. But it says this is going to be done midstream in this scenario of events, and I understand it is not done yet. Have any of you seen the waste characterization that is promised under this?

Have you seen it, Mr. Chairman?

Mr. SLOSKY. We are expecting to see the plan for how they are going to do it in the next several weeks.

Senator DOMENICI. So that is several weeks and that is just one of many.

Now let me also make this point, because I do not think we have made it properly for the record yet. I told my good friend sitting right here, who is not going to run again—he says that he is going to go home—here is what GAO says about Idaho and the INEL temporary storage facilities. I assume you have seen the report.

First it says, the United States has issued a written opinion, Comptroller General, that there is no legal authority for Governor Andrus' action, that his actions violate the supremacy clause.

Then, GAO also determined that INEL has sufficient storage capacity to accommodate Rocky Flat wastes until WIPP becomes fully operational. It did not say until a land withdrawal bill. It did not say until the tests are run, and that is a number of years.

So I want everyone to know that this senator understands that temporary storage of this waste in the country is not safe. Mr. Bishop, you indicated we got a short-term problem, a middle-term problem and a long-term problem. We do, but some people think that Rocky Flats' waste has to go to WIPP or we have to have it ready next week or there is no place to put it, and I have just read something that sort of indicates to the contrary.

So I do not think we are being unreasonable.

But in any event, let me proceed with just a couple of questions. Do you all think that the decision plan that the Secretary has issued is a good plan for doing all of the work that is necessary before we move any waste to WIPP?

Have you all had a chance to review the Secretary's decision plan?

Dr. **Bahr**. Yes.

Senator **Domenici**. You all agree it is a good decision plan? Everybody nodded yes. You all agree we ought to do the things that are on this, as he recommended?

Mr. **Bishop**. Senator, if I may, I think it well captures things that need to be done. There may be other things that need to be done, and perhaps some of those do not necessarily have to be done in that order. So I think like any plan it is important to lay down what has to be done and figure out how you can achieve the end result.

Senator **Domenici**. Do any of you think it is unreasonable for the United States Congress to say we expect these to be done? It might be your minimum, but I gather that you all agree that they ought to be done.

Well, as I understand it, the Secretary says he is going to comply with RCRA. Does anybody here think that WIPP should not comply with RCRA? I would have gathered you might have been saying that, Mr. Bishop.

Mr. **Bishop**. Yes, sir, that is true. That is my opinion. I think more work has to be done to determine whether those criteria are appropriate to transuranic mixed waste. It has been accepted as a matter of faith. There has been no record that it has been analyzed, even by EPA.

Senator **Domenici**. I understand the complexities of that. And I understand that, and I understand that some people even have a history——

You see, the Secretary has said he is going to comply with it, and he has said he is going to get it done by a time certain. So it comes to this senator at least that we ought to now expect that or expect a very, very positive indication by the Secretary why not. That is not done yet, right?

Mr. **Bishop**. I agree, that is not.

Senator **Domenici**. What about DOE's self-certification of compliance with EPA standards for the permanent disposal of the WIPP site? Do any of you, having seen what is going on in the country and what DOE does and how they do their work, do any of you have a concern about whether or not DOE ought to be the one that certifies compliance to EPA standards or should EPA be the certifier, as they are in almost everything else?

Do you have an opinion, Dr. Bahr?

Dr. BAHR. Senator, yes, on that particular one, I think clearly the answer is no, that DOE should not self-certify, and it is not that the Secretary cannot be trusted or that his integrity is questionable, but rather it is an issue of perception. And in the public eye—public perception is critical here, and I think if EPA—EPA is considered by the public to be the guardian of the environment and public health and so forth, and they ought to be the ones to do the certification as opposed to DOE, mainly from the standpoint of credibility of the agency.

Mr. BISHOP. But I do not think there is any technical reason why DOE could not do it.

Senator DOMENICI. We understand that. What you are saying is, as far as the science and the expertise, it could be in DOE, it could be in the Department of Defense. Is that what you are saying?

Mr. BISHOP. Yes, sir.

Senator DOMENICI. Let me ask one last question. If this is a good decision plan, then would it be unreasonable for us to expect that the decisions that are stated herein be complied with before the withdrawal bill? Why is that unreasonable? It seemed to me you were almost all saying withdraw the lands so that we could start.

And it seems to me what maybe I am saying is we have to do all these before we can start and make sure that we have lived up to the commitment on health and safety. Why do we not do these things and then withdraw the land? What is the matter with that scenario?

Dr. KUBO. May I address that by posing back to you, Mr. Domenici, the argument of sequential decision making.

Senator DOMENICI. Of what?

Dr. KUBO. The argument about sequential decision making that was brought forth by Senator Bingaman. If we do things sequentially, and make our decisions, if you will, every time we meet the crossroads, as opposed to anticipate it and keep the momentum up, the program will not necessarily atrophy but it will stagnate.

You have on site a number of people ready to go work. If they are ready to go to work in January of this coming year, as Mr. Slosky suggests, and the Department of Energy had compiled and met with all the items in the decision plan, would the Congress have passed the land withdrawal bill at that moment?

Senator DOMENICI. Well, Doctor, obviously, I cannot say that we would pass it at that moment, but let me assure you that in a democracy like ours, I mean, one week, two weeks, a month. Frankly, we have been at this so long, and I am certain that some of the necessary sequencing has already been violated and broken down in the process of bringing WIPP to where it is.

You know, if we said it would be passed, Doctor, I regret to tell you this—and then it is the end of my time—if we said it will be passed six months after all of this is done, there would not be very many complaints from anyone it would seem like to this senator.

Dr. KUBO. You are much more experienced in formulating meaningful legislation than I am, but I am suggesting that perhaps there is a compromise in which they can proceed on with in situ tests as soon as they meet certain conditions and pass the legislation under that guise.

If we could do that, we could proceed on and address the very difficult issues of whether we should or should not modify the wastes because very clearly if we have to do that, for whatever reasons, the process of licensing, designing and testing a waste modification facility is going to be a long process. I think that is the point I am making.

Senator DOMENICI. I appreciate that. I would only repeat that the Secretary said to us, I think I have it under control, if I can get all of these done, then we can start that—what you just described. And we take him literally. And so those of us who are concerned as to this process dragging for all of these years, while we do not agree with the Governor of Idaho who said there is no more waste going in, he built his case around the land withdrawal bill, get the land withdrawal bill.

I am merely saying the land withdrawal bill should not be used in that kind of way because you cannot do these things until you have complied with these, and I think now the land withdrawal bill becomes leverage to get these things done.

I never saw so many things getting done, as I have in the last five or six months, and it seems to me that that is very, very good. And I just would like that to continue on.

Mr. BISHOP. Senator, may I respond briefly?

10 years ago, a decade ago Congress established WIPP as an R&D facility. Through a number of statutory mechanisms they have held the Department of Energy and EPA responsible for ensuring that public health and safety is protected from the disposal of transuranic wastes.

Unless and until there is some reason to believe that those agencies do not have the ability to exercise that responsibility, it would seem to me there is good cause to move forward with what Congress first established a decade ago.

Senator BINGAMAN. Senator McClure.

Senator MCCLURE. Senator, I have no questions of the panel. I appreciate very much the statements that you have made and the work that you have all individually and collectively given to the charge given to you by the Secretary of the Department of Energy.

I will take only the time of the Committee to again remind us, we are not dealing with WIPP in a vacuum. It is connected to other activities. If indeed it were simply unconnected to everything that this government is doing, then we could indulge ourselves the luxury of protracted and perhaps interminable discussion. But there are other items that it affects in terms of national activities which are very important to us, that will not necessarily accommodate to that leisurely a schedule.

So we have to find a way to accomplish what has to be done. I do not think it is a question of forcing something unnecessarily, but I do think it is necessary to remember that we have to find the answers. We cannot just delay forever.

One comment, and I was not sure that I got the same reaction from all the panel members with respect to RCRA. The thing that concerns me about RCRA, and I think concerns a great many people about it, is RCRA rightly or wrongly has it in a state veto process, which I do not think yields itself very well to these kinds of problems.

And having been in Congress for a long while, I have seen that happen on a number of occasions where in matters of this kind, if the state is given the opportunity to exercise a veto, the political process will demand the state to veto it.

That is my major—not the only, but my major concern about RCRA. Dr. Bahr, I understand what you are saying about credibility of the Department of Energy being self-certifying. We have seen some problems develop under self-certification, and I will not belabor that subject other than to note that it is present. We all know it is present.

But the opposite extreme seems to me to say that the state has to approve every step of the way, which in effect occurs if it is subject to RCRA. Do I read the panel correctly in that regard?

Mr. Slosky, did you——

Mr. **Slosky**. Yes, I might speak to the RCRA issue. Let me back up and say that I think we feel that basically there are known to be RCRA hazardous materials, hazardous wastes in the majority of the WIPP waste and we feel that that hazard needs to be regulated.

There is some issue as to whether the current EPA standards are appropriate for WIPP, and I would concur that, at least in part, that the standards do not seem very appropriate for WIPP. For example, there is an operational requirement that every shipment be opened and tested when it is received at a disposal facility.

In this context that does not seem to make any sense to me. We need to know what is in the waste, but you are not dealing with an unknown shipper shipping to a commercial facility. That is what the RCRA regulations were written to address. So I think there are certainly some aspects of RCRA that should be tailored to this situation.

In terms of the state veto, I think the critical issue is the no migration petition which EPA has proposed to issue, and that particular decision cannot be delegated to any state. That is an EPA headquarters' decision that will be made.

There is also a RCRA permit under I think Part 264 of the RCRA regulations, the Part B permit as it is called, that the State of New Mexico will issue. And certainly one cannot foresee everything that may arise in that permitting process, but we have not picked up any indication that New Mexico is looking at this in any way but a very technical and scientific approach. And my impression is that if compliance with the standards and the requirements of RCRA are demonstrated on a technical basis, that the facility will be permitted.

Senator **McClure**. Any other comments? Let me say in response only this much, it certainly does not stretch your imagination or your memory very much to think of times when people have used an authority to accomplish an end unrelated to the authority granted.

The authority to regulate wastes under RCRA can be used to stop the opening of WIPP. The one thing I would hope to do is to shield the government of the State of New Mexico from having to answer the question from someone else of why did they not use that authority when they could have.

That is unfair burden to put on them under RCRA. And I would share with you the conviction that the authorities of the State of New Mexico have acted responsibly. I see nothing in the record that so far indicates to me that they have not been very responsible in trying to meet all of these questions.

My friend, the senior senator from New Mexico makes a comment about the actions of the Governor of the State of Idaho and says that they are extra-legal. They may well be, but they worked. [Laughter.]

Mr. SLOSKY. Secondly, contrast that to the authority under RCRA to do it legally, without question, as to whether or not it is extra-legal. The temptation is there, and I submit that the pressure is there.

I just do not want to see us involve ourselves in a process that invites the use or abuse of that kind of authority for other ends. And I agree with the senator from New Mexico, certainly the land withdrawal is not the only item on the action agenda, and I do not blame him at all for saying we are going to use that for every bit of leverage we can to force the other actions that need to be taken. I think I did not misquote him when I said that.

But on the other hand, I want to cooperate as much as I can with my friends from New Mexico in terms of the land withdrawal, but something in this process has to give at some point. It is no secret that I think that the Secretary of the Department of Energy is a very enthusiastic, very able man and very misguided in terms of what he thinks he can get done in a time frame, because he keeps making confident predictions about when things will happen.

He has gotten a little more cautious over the months since he has taken that job, but he still says, by this date we will get certain things done. And then you ask him the question, can you guarantee there will not be a lawsuit. No, I cannot. Well, can a lawsuit stop you? Well, yes, it can. Well, how in world can you make any assurances as to time tables?

So I think we have to be very cautious about building up expectations on the part of anyone as to when things will happen and when they will not. I do not think the Secretary has been dishonest in his statements. I think he has failed to calculate some of the odds.

You know, he used to be wearing a uniform where he could order people to do things. He is not in that position now, and I think that is part of the difference. If he could order the senators from New Mexico to line up in favor of the land withdrawal, I suspect he would have issued that order. But he is not in that position.

Senator DOMENICI. I am very glad he is not. [Laughter.]

Senator BINGAMAN. That reminds me, Harry Truman supposedly said that of Eisenhower after he got elected. He said he is going to be surprised when he gets in here and calls someone in and orders them to do something and nothing happens. [Laughter.]

I had one other question, Dr. Kubo, which I would like to ask you. In the testimony of the next panel, the testimony of Robert Neill of the EEG says that estimates indicate that engineering modifications will be required either to prevent the generation of gas or to reduce the amount of gas after generation.

Do you agree with that statement or is that stated too strongly?

Dr. KUBO. I say based on the analysis to date, I would have to agree with that statement, but we have no real—well, let me say no realistic tests done to this date.

So I guess the concern, again: we have no real test data to do some of our performance assessment analyses.

Senator BINGAMAN. Thank you very much. Did you have any additional questions, sir?

Senator DOMENICI. No, I just wanted to say this kind of in wrap up. This senator is fully aware that we are in a very complicated area. I really appreciate the work you have done. And I understand there are many issues here that are very, very difficult, but the only point I want to leave you with so that you do not think that I am a totally unreasonable person, we have been told that a lot of these things were being done for, oh, so many years and they were not being done.

And frankly, it just seems to me that there may be different ways to do this, and some of you drawing this decision plan or getting in on this six or eight years ago might have done it very differently, but we are now at a point where we wanted and still want to believe that complying with this new game plan can be done and that if it is done the health and safety for this 10,000-year implantation is done to the absolute best of the ability of our scientists and our resources.

And I hope you understand that we cannot do what you do. We do not have the luxury of research and of speculation. We have to do the very best we can to get the very best plan. And if it does not work out, then we are not supposed to have a depository. That is why it is called what it is. We have to have credibility.

I hope you understand that. I mean, we cannot say—our good scientists say, let us just go down there and start research and if it does not work we will just take it all out. Our people first of all would not believe you would take it out. The government of the United States in these areas has a difficult time living up to almost anything. It is not always their fault, but that is the way it is. I mean, that is a big issue.

We are being asked if it is retrievable and you all say, it is supposed to be, right? What happens when you find out it must be retrieved? I mean, we are being asked that kind of question, if that ever occurs. We have to have a credible retrievability plan or the whole thing falls and it is the bottom end of the process.

So I think we are on the right track if the Admiral will just keep on pushing this way. And we thank you for what you have done.

Thank you, Mr. Chairman.

Senator BINGAMAN. Thank you very much for your testimony.

On the second panel I would like to call the Hon. Bob Forrest, who is the Major of Carlsbad, New Mexico; Anita Lockwood, who is the Secretary, Department of Energy, Minerals and Natural Resources for the State of New Mexico; and Robert Neill, who is the Director of the Environmental Evaluation Group.

Thank you all for being here, and why do we not go in the order that I introduced you.

Mr. Mayor, if you would go first, please, and then Anita and then Bob.

## STATEMENT OF ROBERT FORREST, MAYOR, CITY OF CARLSBAD, NM

Mr. FORREST. Thank you, Mr. Chairman and Senators, and it is an honor to be here today. And my name is Bob Forrest.

Senator BINGAMAN. Why do you not pull that microphone a little closer if you would, please. Thank you.

Mr. FORREST. My name is Bob Forrest. I am the Mayor of Carlsbad, and I guess we are the reason everyone is here today—19 years ago the former mayor was the one that started this project. But we are located about 30 miles west of the project. We have a population of about 26,000 people, and it is a real privilege to be here today.

But I would like to take a moment or two and give a little history of WIPP, especially to Senator McCLure, of how we got started and where we have come from and to see what is happening.

About 19 years ago, a former mayor and some local officials had read in the newspaper about Lyons, Kansas and what the Atomic Energy Commission was trying to do in Kansas and they tried to go in there and do a facility, a pilot project, and Kansas said no, they did not want any part of this project. So our mayor and some people went to Washington, met with the Atomic Energy Commission, and they were very surprised that anyone would come forward, wanting to volunteer for such a project.

But they made it very clear up front that if they had the support of local government, that they would come into a community, they would be very careful and that safety would be the number one concern and it would be a very slow process.

So they started coming into the area, and I think they changed their name to ERDA and then from there to DOE. But about 1978 to 1981 they came into our area. They drilled some 80 core test holes to see just what was in the area. And in about 1981 I think it changed to the Department of Energy.

They picked the present location of WIPP. They sunk the shaft, and that was the beginning of WIPP.

In 1988, two years ago, WIPP was finished. They spent close to $800 million on that facility. I am not an expert on facilities, but I do know a lot about potash mines, and we have five to six of those potash mines in that area and when you build a potash mine, the state-of-the-art facility costs about $125 million.

So when you look at $800 million that DOE spent, I cannot believe the facility they built. I know that Senator Bingaman and Senator Domenici have been down there and visited and I do not know about Senator McClure, but it is a tremendous facility. It is the best selling point we have, is this project to get people to come down and see what we have to offer.

And I think that is phase 1 of this project. I think that is very important. I think it is a three stage—phase project. I think number 1 is the physical buildings we have, the facility; number 2 is transportation; and number 3 is this five-year test plan.

But going back to stage 1, we have got buildings out there that are tornado proof, the only buildings in New Mexico that can withstand a tornado. We have got air ventilation second to none. We have got 25 state-of-the-art computers and the emergency response room. We have got everything that money could buy, we have it, and if they ask the mayor for a wish list at this facility, I do not know what it would be. I think we have the finest facility that man can build.

Number 2, we go to transportation and not many people said anything about transportation today, but I attended those hearings in Santa Fe, and I will guarantee that is the number one issue of the citizens of New Mexico.

They are very concerned on how this is going to be brought up and down our highways, five years ago, six years ago, it was decided we would not bring it in an airplane, we would not ship it in on a rail car, we would use the highways.

So what does DOE do? They go out and they design a TRUPACT container. It is a square box container. They spent $20 million designing this facility.

After study and testing, they decided it needed some more testing, so they redesigned the whole TRUPACT, and now they have come up with a round cylinder, it looks very much like a coffee can with kind of a round top. It will hold 42 drums of waste.

They spent another $22 million and they now have $42 million in that TRUPACT container, and there is not a container in the world any safer than the TRUPACT container.

The next step in the transportation, you are going to have to have a trucking company to haul that. They went out and they asked for bids to get the best trucking company in America to haul that waste. Our former mayor and some of his friends—I was not one of them—got a trucking company together, put a bid together. The people from Hobbs, New Mexico put a bid together.

I called Ray Romatowski with the DOE, and I put the pressure on him like you would not believe, that I felt like that trucking company ought to go to a New Mexico and especially a southeastern New Mexico contractor. We were in the final four or five of the bids, and Ray Romatowski called me one day and he said, I have bad news. We gave it to another company. But he assured me that the reason they did that was because they had a safe track record, they had experience in hauling nuclear waste and that was the way it was going to be.

We had a commitment 19 years ago that safety was our number one concern. So we are very happy with the trucking company. They are going to have two drivers on each truck. They are going to take drug tests. They are going to have to have 100,000 miles of driving experience. If they have had an accident in the last three years they cannot be hired. They are going to be the state-of-the-art trucking company. So there is hurdle number two.

The TRUPACT was tested. I went up to Albuquerque, and I watched it drop from a 30-foot drop and hit a piece of concrete 30-feet thick. I watched it drop on a 6-inch spike. I watched it be frozen, and I watched it burn in jet fuel at 2,000 degrees. And I do not think there is any way that you could pick a better facility or a better way to haul the waste than the transportation. And that is step number two.

And if you want to go back and grade them on the facility, you want to grade them on the trucking company and the transportation, I think DOE deserves either an A or an A plus.

So here we are at stage number 3 and that is the testing. We cannot put any waste in the facility. We cannot do anything until we get a land withdrawal bill passed, and I am in favor of trying to get one as quick as we can and working together with DOE to get these problems resolved.

But when you go back and you look at the past and you look at the last 19 years, you will never see another relationship like this. And I do not think you will ever see another facility like this opened if WIPP does not get open. To start all over, it would take another 25 years to get where we are.

We have overcome a lot of hurdles. We have been through a lot of governors and a lot of attorney generals, but I still think what our mayor said 19 years ago, that this could be the best thing that ever happened to our city, I am here today to tell you that this is the best thing that ever happened to our city. And I feel very comfortable with the project. I feel very confident that DOE and that the WIPP people can work out the final arrangements and make this a safe facility.

But I am here today to support the $250 million. We promised the people of New Mexico money for the roads, and when you look at the total project and you look at the future of Rocky Flats, the future of Savannah River and all those facilities, their future is in the hands of WIPP, and if we do not make a facility like WIPP, they are all going to be shut down.

But New Mexico is a nuclear state. We have over 70,000 nuclear-related jobs. We have two national laboratories. We were one of the largest producers of uranium. We detonated the first atomic bomb, and I think maybe we have caused part of the problem.

But if we can be of help to the country and serve our Nation and the salt beds for suitable for this type of a project, I urge you and DOE to get these differences resolved and to try to get this land withdrawal bill passed.

I think it is very important that all the testing be done at the site. I do not think it would be very feasible to go to nine different locations and try to do these studies when we told the people of New Mexico, we told the people of Carlsbad that this waste is going to be tested under live, real conditions.

But we strongly support this project, and we will continue to do that. We are getting a little weary sometimes out there on those battle lines. We just came through the New Mexico legislation. They had some two or three anti-WIPP bills introduced. We had one gentleman, and his one platform was to defeat WIPP and to stop WIPP and he did not last about two weeks in the race.

So we do have a few friends out there, but it is a great project, I appreciate the opportunity, Mr. Chairman, to testify.

[The prepared statement of Mr. Forrest follows:]

# TESTIMONY OF THE CITY OF CARLSBAD, NEW MEXICO

# ON THE

# WIPP DECISION PLAN AND PUBLIC LAND WITHDRAWAL

Committee on Energy and Natural Resources
United States Senate

Thursday, April 26, 1990
Washington, D.C.

April 26, 1990

To the Chairman and Members of the U. S. Senate Committee on Energy and Natural Resources:

First of all, I want to thank the Chairman and other members of this Committee who took the time to visit the Site and see for themselves what a tremendous facility the Department of Energy has constructed.

I appreciate this opportunity to appear and make this statement on behalf of the City of Carlsbad, New Mexico.

My name is Bob Forrest. I am the Mayor of Carlsbad. Our City is located about 28 miles northwest of the WIPP project. We have a population of approximately 26,000 people and are located in southeastern New Mexico. I would like to take a few minutes to give this Committee a little history of how the WIPP project got started in southeastern New Mexico. Actually there are three phases in the development of WIPP.

## PHASE ONE - INITIAL DEVELOPMENT

Some 18 years ago our former Mayor and some City officials went to Washington to meet with the Atomic Energy Commission about the possibility of storing transuranic waste in the salt beds east of our City. After reading about the problems, Lyons Kansas had encountered, we felt there may be an opportunity, if the geological formation permitted, to look at a possible pilot project in our area. The Atomic Energy Commission made it very plain that they would not be interested in a possible site in our area unless they had the community's support. We were told at the outset if at any time during the next 5 to 6 years if the City felt uncomfortable with the project that it would be withdrawn. After about 5 years of preliminary work, the Department of Energy came into our area and drilled some 80 test core holes, and after 2 to 3 more years, finally decided on the present site. We have tremendous support from our local potash mining executives who agree that the characteristics of the salt beds would be ideal for such a project.

In 1981, the Department of Energy broke ground for the first shaft at WIPP and from 1981 to 1988, construction of the facility became a reality, we now have a state of the art $800 million finished project. We feel very comfortable with this finished product and think it is the safest facility that any man-made project can be.

## PHASE TWO - TRANSPORTATION

As of this date, the Department of Energy has spent over $40 million designing an extraordinarily safe container. It has been extensively tested through a 30 foot drop including a stationary spike, heating, freezing, and numerous other tests, most of which I have witnesses. As a result of these tests, it has received Nuclear Regulatory Commission certification for safety.

The contract to transport the TRUPACT containers was awarded to an experienced nuclear trucking company after many months of negotiations with over 160 trucking firms from throughout the United States. I feel that with an NRC licensed container, the new satellite controlled trucks, 2 drug free drivers on each truck, the most modern trucking equipment and all of the regulations of the Department of Energy which have been imposed on this firm, the transportation system far exceeds what would normally be required for shipments of this material, and this was confirmed by the National Academy of Sciences in their report dated July 19, 1989, which stated: "The system proposed for transportation of TRU waste to WIPP is safer than that employed for any other hazardous material in the United States today and will reduce risk to very low levels." I feel that these trucks carrying the TRUPACTs will probably be the only 18 wheelers on our nation's highways traveling at the legal speed.

## PHASE THREE - 5 YEAR TEST PLAN

The 5 year test plan, is the most important part of the project to determine the safety and assure our citizens that permanent storage of the transuranic waste at the Site can be accomplished safely without danger to the health, safety, and welfare to our people and the environment. This can only be accomplished by testing at the Site with the same materials that will be used in permanent storage. Our community and State leaders have consistently, from the very beginning, stated that if the scientific tests prove that the Site is not safe that we, the leaders, will lead the charge to shut down the project!

Until such time as a Land Withdrawal Bill is approved giving the DOE the authority, over the Site, none of these tests can go forward. We are now at the most critical point of development of the project. The Federal Government has spent over $800 million to reach this point. Your support of a Land Withdrawal Bill is absolutely necessary if this country is to solve the problem of storage of nuclear waste for now and in the future. Our nation has this one opportunity to finally take positive action to establish a safe and permanent repository for transuranic waste. If we miss this opportunity, I firmly believe that it will be another quarter of a century before our nation can again reach this point. So near, but yet so far, from completing this vital project for our nation's national security.

New Mexico is a nuclear State. As a State, we have over 70,000 people employed in nuclear related jobs. We have 2 national laboratories, Los Alamos and Sandia. We saw the beginning of the atomic age with the detonation of the world's first atomic bomb. At one time, we were the largest producer of uranium ore in the United States. As Mayor of Carlsbad, I feel that the State of New Mexico has an obligation to help solve this national problem. It is costing the Federal Government and the taxpayers over $100 million a year for each year that this project is delayed.

With the strong support of New Mexico's elected officials for the past 15 years and the verbal and written commitment made by DOE to support the efforts to obtain $250 million for the State of New Mexico to assist in the construction of bypasses around major cities off the interstate system and to compensate for lost mineral royalties on the land to be withdrawn, I feel New Mexico is entitled to this money! When you consider the magnitude of the project and the small amount of money requested, it is peanuts in the total operation of our national defense system! The opening of WIPP is the key to the future of Rocky Flats, Savannah River, INEL, and all other DOE nuclear facilities. With the nation's investment to date, the monies requested by the State of New Mexico is insignificant. We deserve these funds for being the host State.

**WIPP IS THE SOLUTION! NOT THE PROBLEM!**

Thank you for your time and consideration of your request.

Senator **Bingaman**. Thank you very much, Mayor Forrest.

Anita Lockwood, would you please go ahead.

## STATEMENT OF ANITA LOCKWOOD, SECRETARY, ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT, STATE OF NEW MEXICO, ON BEHALF OF GOVERNOR GARREY CARRUTHERS

Ms. **Lockwood**. Mr. Chairman, members of the Committee. I am here today to present testimony on behalf of Governor Garrey Carruthers and the State of New Mexico. I am the Secretary of New Mexico's Energy, Minerals and Natural Resources Department and the Chairman of the State's Radioactive Waste Consultation Task Force.

My comments will address both the Department of Energy's decision plan for opening WIPP and a number of issues surrounding the withdrawal of public lands for the facility.

Mr. Chairman, we believe it is important for New Mexico's concerns to be given priority attention since New Mexico is the state hosting the repository. With WIPP located in New Mexico and numerous transportation routes converging within our borders, there is no doubt the WIPP project will impact New Mexico to a far greater degree than any other state, both during its operational life and for thousands of years to come.

Let me first address the Department of Energy's decision plan, and I will keep this brief and go on to the land withdrawal, which I think is the key issue.

In our opinion, the decision plan process has resulted in a clearer definition of the project and its interdependent components, and the issues which must be satisfactorily resolved prior to any wastes being transported to the facility.

In the area of issues resolution, which is addressed by the plan, we cannot over-emphasize the importance the State of New Mexico places on independent scientific peer review of WIPP project activities by such entities as the National Academy of Sciences, the Blue Ribbon Panel and other nationally recognized scientific groups.

It is imperative that DOE give significant weight to the comments and recommendations made by these review groups, particularly in the experimental program plan and determining WIPP's operational readiness for waste receipt.

We agree with Senator Domenici. Upon satisfactory completion of all activities and prerequisites listed in the DOE decision plan, and of course, that does include a land withdrawal bill, the State of New Mexico will support the opening of the WIPP facility for the five-year test phase.

On this important issue, New Mexico believes the DOE must continue to seek consensus on the extent and nature of the proposed experiments from the review groups and the Environmental Protection Agency.

Careful execution of the test phase is essential to ensure the highest level of confidence in WIPP's long-term integrity for the protection of future generations.

The State of New Mexico does not support the operations demonstration phase of the program. The State is opposed to the shipments of large waste volumes to WIPP for the highly questionable purpose of demonstrating full capacity operations.

We will continue to oppose the unwarranted demonstration until such time as the DOE demonstrates compliance with the applicable EPA disposal standards, 40 C.F.R. 191, Subpart B. We believe it makes no sense to transport significant quantities of waste to WIPP before determining whether the repository is suitable as a permanent disposal facility.

In terms of the decision plan, we encourage the DOE to continue in its effort to resolve all outstanding issues in a methodical, timely fashion and New Mexico concurs with the senators, that Congress should use the decision plan to closely monitor DOE's progress and efficiency. Unquestionably, full and complete compliance with all relevant EPA standards is of paramount importance to New Mexico.

Let me now address the issue of the land withdrawal. Clearly, a critical prerequisite for the initial receipt of waste at WIPP is the withdrawal of Federal lands at the site. For over 10 years the DOE has conducted its tests and site preparations in New Mexico under a series of administrative withdrawal orders issued by the Bureau of Land Management.

These orders however preclude the storage or disposal of any radioactive materials at the 10,240-acre withdrawal area. Therefore, in April 1989 the DOE submitted to BLM an application for modification of its existing administrative land withdrawal order, Public Land Order 6403.

The State of New Mexico adamantly opposes the proposed modification to the existing WIPP administrative withdrawal order and opposes any further administrative withdrawals of Federal land for the project.

The reasons for our opposition are twofold. Such a withdrawal circumvents the intents expressed in the Federal Land Policy Management Act, which is the preeminent law governing all withdrawals of Federal lands. And more importantly, such actions would not provide adequate protection for the public health and safety or the environment.

Because the WIPP land withdrawal area comprises 10,240 acres, and the period will be extending for more than 20 years, and because the integrity of the site must be protected for tens of thousands of years, the permanent withdrawal of Federal land for the WIPP project clearly requires congressional approval.

Only a legislative withdrawal provides the opportunity to ensure appropriate safeguards are imposed on the facilities and related operations. Only through legislation can the EPA be required to verify DOE's compliance with the applicable repository standards for both storage and disposal of transuranic radioactive wastes at WIPP.

Only legislation can provide for independent peer review of DOE procedures, for radiological monitoring and worker protection at the site, and only legislation can mandate the implementation of an appropriate measures for the safe transportation of WIPP.

With respect to the issue of the land withdrawal and the need for legislation, I respectfully offer for the Committee's review and consideration a resolution of the Western Governors' Association related to the WIPP project. We have submitted this as attachment 1 to our testimony.

I will not got into detail, but the resolution was signed by all 20 governors who are members of the Western Governors' Association. The resolution lists a number of important provisions which the western governors strongly support for inclusion in any WIPP legislative proposal.

Because the vast majority of radioactive waste destined for WIPP is currently stored in or will be transported through the western United States, we urge Congress to give significant weight to our call for legislation containing at a minimum those provisions outlined in the Western Governors' Association resolution.

Finally, for the record, the Committee should also be aware that in October 1989 the Radioactive and Hazardous Materials Committee of the New Mexico State Legislature unanimously adopted a resolution calling for the Congress to enact legislation to withdraw the lands needed for the WIPP project in order to clear the way for the five-year test phase to begin. Only by allowing this testing to proceed will the ultimate feasibility and safety of the facility be determined.

Now let me address a vital interest unique to the State of New Mexico, and that is compensation for costs incurred for hosting this national repository. New Mexico's congressional delegation has repeatedly called for DOE to live up to all of its commitments to the State of New Mexico.

In light of recent comments to this Committee by DOE Secretary Watkins, New Mexico emphasizes these DOE commitments are legally binding and sanctioned by the United States District Court for the State of New Mexico.

New Mexico continues to confront the critical need for Federal compensation directly related to non-interstate highways to be used as WIPP transportation routes. In December 1982, the DOE made a legal commitment to make a good faith effort to assist the state and its congressional delegation in seeking a special congressional appropriation for upgrading select segments of WIPP transportation routes.

All of these segments are sections of non-interstate highways which must be used to reach the WIPP site. The situation is unique to New Mexico and is the reason why DOE agreed these projects warranted Federal funding.

After almost eight years however the State of New Mexico still lacks $43 million for the necessary WIPP road improvements. These monies were appropriated to DOE in 1988, but at the direction of Congress have not yet been released to us.

New Mexico has already spent $14.5 million from State and other revenue for projects related to upgrading these essential WIPP non-interstate transportation routes, and we estimate that we will spend another $26.6 million in state revenue that will be required for additional WIPP highway improvements.

Next, in August of 1987, the DOE made a legal commitment to a good faith effort to support efforts to obtain Federal funds for bypasses and relief routes along WIPP transportation corridors in New Mexico. Again, these bypasses and relief routes are located along non-interstate highways and are necessary to prevent the

WIPP shipments from traveling through downtown sections of several New Mexico communities.

To date the State of New Mexico has not received any funds for these projects. New Mexico has proceeded to plan the bypass routes and has spent over $7.2 million to date in State funds in order to expedite the projects.

Further, the significant delays in receiving funds from the Federal Government will cause additional financial impact to the State. Due to the delays, it is now estimated the state must fund at least an additional $100 million from its own revenue sources to complete the phased relief and bypass projects for the WIPP project.

In total, when complete, New Mexico currently estimates it will be required to spent nearly $150 million from state sources to accommodate the WIPP non-interstate transportation routes. And clearly, for a small population state, New Mexico has contributed more than its fair share to the objectives of the Nation and DOE with respect to readiness for transportation to the WIPP facilities.

For these reasons, New Mexico appeals to Congress to take appropriate steps to release the $43 million in appropriated funds so DOE may fulfill its 1982 commitment to the State. New Mexico also urgently requests your support to help acquire the $250 million appropriation to the State as a part of the WIPP land withdrawal legislation.

Mr. Chairman, let me address very briefly in closing the draft land withdrawal legislation that has been submitted to the Department of Energy for your consideration. The State of New Mexico regards the DOE land withdrawal bill as seriously deficient in terms of protecting the public health, safety and the environment from those risks posed by the transportation, storage and disposal of wastes at the WIPP repository.

The DOE's proposed WIPP land withdrawal legislation is unacceptable for several reasons. It contains few of the provisions called for in the attached resolution of the Western Governors' Association. It contains few of the provisions included in previous versions of our congressional delegation's WIPP land withdrawal legislation, and it contains few of the provisions necessary to satisfy DOE's legally binding written commitments to the State of New Mexico, as we have outlined in this testimony.

We have included as an attachment to our testimony details which outline the key provisions which must be addressed in the land withdrawal legislation. And we defer to our representatives, Senators Domenici and Bingaman, who are on this Committee, and we will continue to work with our congressional delegation to construct an acceptable bill which will not only ensure WIPP is open and operated in a safe manner, but will ultimately instill a high level of confidence in the repository's long-term integrity.

That concludes my remarks on behalf of the Governor and the State of New Mexico. Thank you, Mr. Chairman.

[The prepared statement of Ms. Lockwood follows:]

# TESTIMONY OF THE STATE OF NEW MEXICO
# ON THE
# WIPP DECISION PLAN AND PUBLIC LAND WITHDRAWAL

**Committee on Energy and Natural Resources**
**United States Senate**

**Thursday, April 26, 1990**
**Washington, D.C.**

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE. MY NAME IS ANITA LOCKWOOD. I AM HERE TODAY TO PRESENT TESTIMONY ON BEHALF OF GOVERNOR GARREY CARRUTHERS AND THE STATE OF NEW MEXICO. I AM THE SECRETARY OF NEW MEXICO'S ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT AND CHAIRMAN OF THE STATE'S RADIOACTIVE WASTE CONSULTATION TASK FORCE. MY COMMENTS WILL ADDRESS BOTH THE U.S. DEPARTMENT OF ENERGY'S (DOE) DECISION PLAN FOR OPENING WIPP, AND A NUMBER OF ISSUES SURROUNDING THE WITHDRAWAL OF PUBLIC LANDS FOR THE WIPP FACILITY.

TO BEGIN, THANK YOU CHAIRMAN JOHNSTON AND OTHER MEMBERS OF THE SENATE COMMITTEE FOR THIS OPPORTUNITY FOR NEW MEXICO TO COMMENT ON ISSUES RELATING TO THE INITIAL RECEIPT OF WASTE AT WIPP. IT IS IMPORTANT FOR NEW MEXICO'S CONCERNS TO BE GIVEN PRIORITY ATTENTION SINCE NEW MEXICO IS THE STATE HOSTING THE REPOSITORY. WITH WIPP LOCATED IN NEW MEXICO, AND NUMEROUS TRANSPORTATION ROUTES CONVERGING WITHIN OUR BORDERS, THERE IS NO DOUBT THE WIPP PROJECT WILL IMPACT NEW MEXICO TO A FAR GREATER DEGREE THAN ANY OTHER STATE – BOTH DURING ITS OPERATIONAL LIFE AND FOR THOUSANDS OF YEARS TO COME.

## DOE DECISION PLAN ON WIPP

LET ME FIRST ADDRESS THE DEPARTMENT OF ENERGY'S DECISION PLAN. IN OUR OPINION, THE DECISION PLAN PROCESS HAS RESULTED IN A CLEARER DEFINITION OF THE PROJECT AND ITS INTERDEPENDENT COMPONENTS, AND THE ISSUES WHICH MUST BE SATISFACTORILY RESOLVED PRIOR TO ANY WASTES BEING TRANSPORTED TO THE FACILITY. THE PROCESS HAS INCORPORATED MANY CHANGES BASED ON COMMENTS PROVIDED BY NEW MEXICO AND OTHER REVIEWERS. THE MOST RECENT VERSION NOW LISTS VIRTUALLY ALL PREREQUISITES AND KEY ACTIVITIES LEADING TO A DECISION ON WIPP'S PHYSICAL AND OPERATIONAL READINESS FOR INITIAL WASTE RECEIPT. THE PLAN IDENTIFIES THE VARIOUS INDEPENDENT REVIEW GROUPS AND OTHER ENTITIES WHO WILL ACTIVELY PARTICIPATE IN THE DECISION-MAKING PROCESS. HOWEVER, HOW THEIR COMMENTS AND RECOMMENDATIONS WILL BE HANDLED BY DOE AND HOW THIS WILL AFFECT THE DECISION-MAKING PROCESS STILL REMAINS UNCLEAR.

THE DOE HAS BEEN DILIGENT IN REVISING THE DOCUMENT TO REFLECT THE MOST CURRENT AVAILABLE INFORMATION. WE ARE ENCOURAGED BY DOE'S WILLINGNESS TO REPORT BOTH PROGRESS AND DELAYS IN ISSUE RESOLUTION. THE BRIEFINGS TO THE STATES HAVE BEEN VALUABLE OPPORTUNITIES FOR INTERACTION BETWEEN DOE AND THE STATES CURRENTLY STORING WASTES DESTINED FOR WIPP. THE DISCUSSIONS ON INTERIM WASTE STORAGE HAVE BEEN CONTROVERSIAL YET INFORMATIVE. NONETHELESS, NEW MEXICO AND THE OTHER SIX STATES TARGETED FOR INTERIM STORAGE OF ROCKY FLATS PLANT WASTES REMAIN UNITED AND STEADFAST IN OUR OPPOSITION TO SUCH A PROPOSAL.

THE STATE OF NEW MEXICO BELIEVES THERE HAS BEEN DEFINITIVE PROGRESS OVER THE PAST YEAR TOWARD COMPLETING MANY OF THE ACTIVITIES OUTLINED IN THE DECISION PLAN. FOR EXAMPLE, THE TRANSPORTATION PACKAGING CONTAINER FOR CONTACT-HANDLED TRANSURANIC WASTE, TRUPACT-II, RECEIVED THE U.S. NUCLEAR REGULATORY COMMISSION'S CERTIFICATION ON AUGUST 30, 1989. IN LATE JANUARY 1990, THE FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS) ON WIPP WAS RELEASED TO THE PUBLIC, AND WE UNDERSTAND DOE'S "RECORD OF DECISION" ON THE DOCUMENT IS EXPECTED TO BE ISSUED IN THE NEAR FUTURE. DOE REPORTS THE FINAL SAFETY ANALYSIS REPORT IS APPROACHING COMPLETION. FINALLY, EARLIER THIS MONTH, THE U.S. ENVIRONMENTAL PROTECTION AGENCY ISSUED ITS PROPOSED REGULATION GRANTING A CONDITIONAL NO-MIGRATION VARIANCE FOR THE

WIPP FACILITY. CLEARLY, THE FINAL EPA RULING WHICH IS EXPECTED SOMETIME THIS FALL IS CRITICAL TO MOVING FORWARD WITH WIPP.

IN THE AREA OF ISSUES RESOLUTION, WE CANNOT OVEREMPHASIZE THE IMPORTANCE THE STATE OF NEW MEXICO PLACES ON INDEPENDENT SCIENTIFIC PEER REVIEW OF WIPP PROJECT ACTIVITIES BY SUCH ENTITIES AS THE NATIONAL ACADEMY OF SCIENCES, BLUE RIBBON PANEL AND OTHER NATIONALLY RECOGNIZED SCIENTIFIC GROUPS. IT IS IMPERATIVE THAT DOE GIVE SIGNIFICANT WEIGHT TO THE COMMENTS AND RECOMMENDATIONS MADE BY THESE REVIEW GROUPS, PARTICULARLY IN STRUCTURING THE EXPERIMENTAL PROGRAM PLAN AND DETERMINING WIPP'S OPERATIONAL READINESS FOR WASTE RECEIPT.

UPON SATISFACTORY COMPLETION OF ALL ACTIVITIES AND PREREQUISITES LISTED IN THE DOE DECISION PLAN, THE STATE OF NEW MEXICO WILL SUPPORT THE OPENING OF THE WIPP FACILITY FOR THE FIVE-YEAR TEST PHASE. ON THIS IMPORTANT ISSUE, NEW MEXICO BELIEVES THE DOE MUST CONTINUE TO SEEK CONSENSUS ON THE EXTENT AND NATURE OF THE PROPOSED EXPERIMENTS FROM THE REVIEW GROUPS AND ENVIRONMENTAL PROTECTION AGENCY. CAREFUL EXECUTION OF THE TEST PHASE IS ESSENTIAL TO ENSURE THE HIGHEST LEVEL OF CONFIDENCE IN WIPP'S LONG-TERM INTEGRITY FOR THE PROTECTION OF FUTURE GENERATIONS.

THE STATE OF NEW MEXICO DOES NOT SUPPORT THE OPERATIONS DEMONSTRATION PHASE OF THE PROGRAM. THE STATE IS OPPOSED TO THE SHIPMENT OF LARGE WASTE VOLUMES TO WIPP FOR THE HIGHLY QUESTIONABLE PURPOSE OF DEMONSTRATING FULL-CAPACITY OPERATIONS. WE WILL CONTINUE TO OPPOSE THE UNWARRANTED DEMONSTRATION UNTIL SUCH TIME AS THE DOE DEMONSTRATES COMPLIANCE WITH THE APPLICABLE EPA DISPOSAL STANDARDS, 40 CFR 191, SUBPART B. IT MAKES NO SENSE TO TRANSPORT SIGNIFICANT QUANTITIES OF WASTE TO WIPP BEFORE DETERMINING WHETHER THE REPOSITORY IS SUITABLE AS A PERMANENT DISPOSAL FACILITY.

AS AN EXAMPLE, IT IS POSSIBLE THE EXPERIMENTAL PROGRAM WILL PRODUCE COMPELLING EVIDENCE IN SUPPORT OF WASTE FORM MODIFICATION. THIS WOULD THEN REQUIRE THE WASTE DRUMS TO BE MOVED TO THE SURFACE FROM THE WIPP UNDERGROUND REPOSITORY, TREATED, AND THEN RE-EMPLACED IN THE REPOSITORY. THIS WOULD RESULT IN DOUBLE-HANDLING OF THE WASTES, NEEDLESSLY SUBJECTING WORKERS TO ADDITIONAL RADIATION EXPOSURES. IN LIGHT OF THE ATTENDANT HEALTH RISKS, PRUDENCE CLEARLY DICTATES THAT DOE PROCEED WITH

CONSIDERABLE CAUTION TO ENSURE SUCH A SITUATION DOES NOT OCCUR.

IN CONCLUSION, WE ENCOURAGE THE DOE TO CONTINUE IN ITS EFFORTS TO RESOLVE ALL OUTSTANDING ISSUES IN A METHODICAL, TIMELY FASHION. NEW MEXICO BELIEVES CONGRESS SHOULD USE THE DECISION PLAN TO CLOSELY MONITOR DOE'S PROGRESS AND EFFICIENCY. UNQUESTIONABLY, FULL AND COMPLETE COMPLIANCE WITH ALL RELEVANT EPA STANDARDS IS OF PARAMOUNT IMPORTANCE TO NEW MEXICO.

## LAND WITHDRAWAL

LET ME NOW ADDRESS THE ISSUE OF THE LAND WITHDRAWAL. A CRITICAL PREREQUISITE FOR INITIAL WASTE RECEIPT AT WIPP IS THE WITHDRAWAL OF FEDERAL LAND AT THE SITE. FOR OVER TEN YEARS, THE DOE HAS CONDUCTED ITS TESTS AND SITE PREPARATIONS IN NEW MEXICO UNDER A SERIES OF ADMINISTRATIVE WITHDRAWAL ORDERS ISSUED BY THE BUREAU OF LAND MANAGEMENT (BLM) OF THE U.S. DEPARTMENT OF INTERIOR.

THESE ORDERS, HOWEVER, PRECLUDE THE STORAGE OR DISPOSAL OF ANY RADIOACTIVE MATERIALS AT THE 10,240-ACRE WITHDRAWAL AREA. THEREFORE, IN APRIL 1989 THE DOE SUBMITTED TO BLM AN APPLICATION FOR MODIFICATION OF ITS EXISTING ADMINISTRATIVE LAND WITHDRAWAL ORDER, PUBLIC LAND ORDER 6403.

THE STATE OF NEW MEXICO ADAMANTLY OPPOSES THE PROPOSED MODIFICATION TO THE EXISTING WIPP ADMINISTRATIVE WITHDRAWAL ORDER AND OPPOSES ANY FURTHER ADMINISTRATIVE WITHDRAWALS OF FEDERAL LAND FOR THE PROJECT. THE REASONS FOR OUR OPPOSITION ARE TWOFOLD: SUCH A WITHDRAWAL CIRCUMVENTS THE INTENTS EXPRESSED IN THE FEDERAL LAND POLICY AND MANAGEMENT ACT, AND, MORE IMPORTANTLY, SUCH ACTIONS WOULD NOT PROVIDE ADEQUATE PROTECTION OF THE PUBLIC HEALTH AND SAFETY OR THE ENVIRONMENT.

THE FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA) IS THE PREEMINENT LAW GOVERNING ALL WITHDRAWALS OF FEDERAL LAND. IT ESTABLISHES PUBLIC LAND POLICY AND PROVIDES SPECIFIC GUIDELINES FOR ITS ADMINISTRATION AND MANAGEMENT. THE ACT CLEARLY STATES: "...A WITHDRAWAL AGGREGATING FIVE THOUSAND (5,000) ACRES OR MORE MAY BE MADE...ONLY FOR A PERIOD OF NOT MORE THAN TWENTY (20) YEARS BY THE INTERIOR SECRETARY." [PUBLIC LAW 94-579, TITLE II, SECTION 204(C)]

IT IS THEREFORE EVIDENT A PROPOSED FEDERAL LAND WITHDRAWAL EXTENDING OVER A PERIOD OF MORE THAN 20 YEARS CAN BE EXECUTED

ONLY BY ACTION OF THE U.S. CONGRESS.

BECAUSE THE WIPP LAND WITHDRAWAL AREA COMPRISES 10,240 ACRES, AND BECAUSE THE INTEGRITY OF THE SITE MUST BE PROTECTED FOR TENS OF THOUSANDS OF YEARS, THE PERMANENT WITHDRAWAL OF FEDERAL LAND FOR THE WIPP PROJECT CLEARLY REQUIRES CONGRESSIONAL APPROVAL. ONLY A LEGISLATIVE WITHDRAWAL PROVIDES THE OPPORTUNITY TO ENSURE APPROPRIATE SAFEGUARDS ARE IMPOSED ON THE FACILITY AND RELATED OPERATIONS.

- ONLY THROUGH LEGISLATION CAN THE EPA BE REQUIRED TO VERIFY DOE'S COMPLIANCE WITH THE APPLICABLE REPOSITORY STANDARDS FOR BOTH STORAGE AND DISPOSAL OF TRANSURANIC RADIOACTIVE WASTES AT WIPP.

- ONLY LEGISLATION CAN PROVIDE FOR INDEPENDENT PEER REVIEW OF DOE PROCEDURES FOR RADIOLOGICAL MONITORING AND WORKER PROTECTION AT THE SITE.

- ONLY LEGISLATION CAN MANDATE THE IMPLEMENTATION OF APPROPRIATE MEASURES FOR THE SAFE TRANSPORT OF WIPP SHIPMENTS.

WITH RESPECT TO THE ISSUE OF LAND WITHDRAWAL AND THE NEED FOR LEGISLATION, I RESPECTFULLY OFFER FOR THE COMMITTEE'S REVIEW AND CONSIDERATION A RESOLUTION OF THE WESTERN GOVERNORS' ASSOCIATION (WGA) RELATING TO THE WIPP PROJECT. WGA RESOLUTION 89-006, WHICH WAS APPROVED LAST SUMMER, STATES "...LAND WITHDRAWAL LEGISLATION IS THE MOST APPROPRIATE MEANS TO ENSURE THAT KEY ISSUES RELATING TO THE OPENING AND OPERATION OF THE WIPP ARE SATISFACTORILY RESOLVED." THIS RESOLUTION WAS SIGNED BY ALL 20 GOVERNORS WHO ARE MEMBERS OF THE WGA.

THIS RESOLUTION ALSO LISTS A NUMBER OF IMPORTANT PROVISIONS WHICH THE WESTERN GOVERNORS STRONGLY SUPPORT FOR INCLUSION IN ANY WIPP LEGISLATIVE PROPOSAL. BECAUSE THE VAST MAJORITY OF RADIOACTIVE WASTE DESTINED FOR WIPP IS CURRENTLY STORED IN, OR WILL BE TRANSPORTED THROUGH, THE WESTERN UNITED STATES, WE URGE CONGRESS TO GIVE SIGNIFICANT WEIGHT TO OUR CALL FOR LEGISLATION CONTAINING, AT A MINIMUM, THOSE PROVISIONS OUTLINED IN THE WESTERN GOVERNORS' ASSOCIATION RESOLUTION.

FINALLY, FOR THE RECORD, THE COMMITTEE SHOULD ALSO BE AWARE THAT IN OCTOBER 1989, THE RADIOACTIVE AND HAZARDOUS MATERIALS COMMITTEE OF THE NEW MEXICO STATE LEGISLATURE UNANIMOUSLY ADOPTED A RESOLUTION CALLING FOR THE

CONGRESS TO ENACT LEGISLATION TO WITHDRAW THE LANDS NEEDED FOR THE WIPP PROJECT IN ORDER TO CLEAR THE WAY FOR THE 5-YEAR TEST PHASE TO BEGIN. ONLY BY ALLOWING THIS TESTING TO PROCEED WILL THE ULTIMATE FEASIBILITY AND SAFETY OF THE FACILITY BE DETERMINED.

LET ME NOW ADDRESS A VITAL INTEREST UNIQUE TO THE STATE OF NEW MEXICO: COMPENSATION FOR COSTS INCURRED IN HOSTING THIS NATIONAL REPOSITORY. NEW MEXICO'S CONGRESSIONAL DELEGATION HAS REPEATEDLY CALLED FOR THE DOE TO LIVE UP TO ALL OF ITS COMMITMENTS TO THE STATE OF NEW MEXICO. IN LIGHT OF RECENT COMMENTS TO THIS COMMITTEE BY DOE SECRETARY WATKINS, NEW MEXICO EMPHASIZES THESE DOE COMMITMENTS ARE LEGALLY BINDING AND SANCTIONED BY THE UNITED STATES DISTRICT COURT FOR THE STATE OF NEW MEXICO.

SINCE WIPP'S INCEPTION OVER 15 YEARS AGO, NEW MEXICO HAS REQUESTED LITTLE FROM THE FEDERAL GOVERNMENT IN THE WAY OF SPECIAL CONSIDERATIONS RELATING TO THE PROJECT. IN FACT, THE STATE'S EXISTING LIMITED RIGHTS ARE THE RESULT OF A LAWSUIT FILED BY THE STATE IN THE EARLY 1980s TO PROTECT NEW MEXICO'S INTERESTS. LITIGATION WAS NECESSARY AT THAT TIME TO FORCE DOE TO SIMPLY "CONSULT AND COOPERATE" WITH THE STATE, EVEN THOUGH WIPP'S ENABLING LEGISLATION MANDATED SUCH APPROPRIATE AND REASONABLE ACTION.

NEW MEXICO CONTINUES TO CONFRONT THE CRITICAL NEED FOR FEDERAL COMPENSATION DIRECTLY RELATED TO NON-INTERSTATE HIGHWAYS TO BE USED AS WIPP TRANSPORTATION ROUTES. IN DECEMBER 1982, THE DOE MADE A LEGAL COMMITMENT TO MAKE A GOOD-FAITH EFFORT TO ASSIST THE STATE AND ITS DELEGATION IN SEEKING A SPECIAL CONGRESSIONAL APPROPRIATION FOR UPGRADING SELECTED SEGMENTS OF WIPP TRANSPORTATION ROUTES. ALL OF THESE SEGMENTS ARE SECTIONS OF NON-INTERSTATE HIGHWAYS WHICH MUST BE USED TO REACH THE WIPP SITE. THIS SITUATION IS UNIQUE TO NEW MEXICO AND IS THE REASON WHY DOE AGREED THESE PROJECTS WARRANT FEDERAL FUNDING.

AFTER ALMOST EIGHT YEARS, HOWEVER, THE STATE OF NEW MEXICO STILL LACKS $43 MILLION FOR THE NECESSARY WIPP ROAD IMPROVEMENTS. THESE MONIES WERE APPROPRIATED TO DOE IN 1988, BUT AT THE DIRECTION OF CONGRESS, HAVE NOT YET BEEN RELEASED TO US. NEW MEXICO HAS ALREADY SPENT $14.5 MILLION FROM STATE AND OTHER REVENUE FOR PROJECTS RELATED TO UPGRADING THESE ESSENTIAL WIPP NON-INTERSTATE TRANSPORTATION ROUTES, AND IT IS ESTIMATED THAT ANOTHER $26.6 MILLION IN STATE REVENUE WILL

BE REQUIRED FOR ADDITIONAL WIPP HIGHWAY IMPROVEMENTS.

NEXT, IN AUGUST 1987, THE DOE MADE A LEGAL COMMITMENT TO A GOOD-FAITH EFFORT TO SUPPORT EFFORTS TO OBTAIN FEDERAL FUNDS FOR BY-PASSES AND RELIEF ROUTES ALONG WIPP TRANSPORTATION CORRIDORS IN NEW MEXICO. AGAIN, THESE BY-PASSES AND RELIEF ROUTES ARE LOCATED ALONG NON-INTERSTATE HIGHWAYS AND ARE NECESSARY TO PREVENT THE WIPP SHIPMENTS FROM TRAVELING THROUGH DOWNTOWN SECTIONS OF SEVERAL NEW MEXICO COMMUNITIES. TO DATE, THE STATE OF NEW MEXICO HAS NOT RECEIVED ANY FUNDS FOR THESE PROJECTS.

NEW MEXICO HAS PROCEEDED TO PLAN THE BYPASS ROUTES AND HAS SPENT OVER $7.2 MILLION TO DATE IN STATE FUNDS IN ORDER TO EXPEDITE THE PROJECTS. FURTHER, THE SIGNIFICANT DELAYS IN RECEIVING FUNDS FROM THE FEDERAL GOVERNMENT WILL CAUSE ADDITIONAL FINANCIAL IMPACT TO THE STATE OF NEW MEXICO. DUE TO THE DELAYS, IT IS NOW ESTIMATED THE STATE MUST FUND AT LEAST AN ADDITIONAL $100 MILLION FROM ITS OWN REVENUE SOURCES TO COMPLETE THE PHASED RELIEF AND BYPASS PROJECTS FOR THE WIPP PROJECT.

IN TOTAL, WHEN COMPLETE, NEW MEXICO CURRENTLY ESTIMATES IT WILL BE REQUIRED TO SPEND NEARLY $150 MILLION FROM STATE SOURCES TO ACCOMMODATE THE ESSENTIAL WIPP NON-INTERSTATE TRANSPORTATION ROUTES. CLEARLY, FOR A SMALL POPULATION STATE, NEW MEXICO HAS CONTRIBUTED MORE THAN ITS FAIR SHARE TO THE OBJECTIVES OF THE NATION AND DOE WITH RESPECT TO READINESS FOR TRANSPORTATION TO THE WIPP FACILITY.

FOR THESE REASONS, NEW MEXICO APPEALS TO CONGRESS TO TAKE APPROPRIATE STEPS TO RELEASE THE $43 MILLION IN APPROPRIATED FUNDS SO DOE MAY FULFILL ITS 1982 COMMITMENT TO THE STATE. NEW MEXICO ALSO REQUESTS YOUR SUPPORT FOR A $250 MILLION APPROPRIATION TO THE STATE AS A PART OF THE WIPP LAND WITHDRAWAL LEGISLATION. THIS APPROPRIATION WOULD NOT ONLY SATISFY DOE'S 1987 OBLIGATION TO THE STATE FOR NON-INTERSTATE HIGHWAY CONSTRUCTION, BUT WOULD ALSO COMPENSATE NEW MEXICO FOR LOST REVENUES RESULTING FROM THE PERPETUAL WITHDRAWAL OF FEDERAL LANDS IN NEW MEXICO.

THROUGHOUT THE TEN-YEAR HISTORY OF THE WIPP PROJECT, THE STATE OF NEW MEXICO HAS MADE EVERY EFFORT TO WORK COOPERATIVELY WITH THE FEDERAL GOVERNMENT ON THIS CONTROVERSIAL PROJECT. WHEN AN EXCHANGE OF STATE LANDS WITHIN THE WIPP WITHDRAWAL AREA WAS DETERMINED TO BE NECESSARY, NEW

MEXICO NEGOTIATED IN GOOD FAITH AND EXECUTED THE EXCHANGE IN A RELATIVELY SHORT PERIOD. WHEN IT WAS DETERMINED A STATE LAW WAS NOT CONSTRUCTED TO ACCOMMODATE THE WIPP PROJECT, THE NEW MEXICO LEGISLATURE MOVED QUICKLY TO ENACT THE NECESSARY LEGISLATION TO ALLOW THE WIPP PROJECT TO MOVE FORWARD. WHEN IT WAS DETERMINED THE STATE HAD NOT DESIGNATED WIPP ROUTES TO COMPLY WITH APPLICABLE FEDERAL DEPARTMENT OF TRANSPORTATION REGULATIONS, NEW MEXICO TOOK IMMEDIATE STEPS TO BEGIN THE PROCESS OF PROPERLY DESIGNATING HIGHWAY ROUTES.

THE STATE OF NEW MEXICO HAS LIVED UP TO ITS END OF THE BARGAIN. THE STATE HAS CONSISTENTLY AND DILIGENTLY FULFILLED ALL COMMITMENTS NECESSARY TO ALLOW THE WIPP PROJECT TO DEVELOP AND MOVE FORWARD TO THE OPENING OF THE FACILITY FOR ITS FIVE-YEAR TEST PHASE. THE LAND WITHDRAWAL LEGISLATION IS A CRITICAL AND ESSENTIAL STEP IN THIS PROCESS. THE STATE OF NEW MEXICO BELIEVES NOW IS THE TIME FOR THE FEDERAL GOVERNMENT TO HONOR ITS COMMITMENTS TO THE STATE. ADEQUATE HEALTH AND SAFETY ASSURANCES TO THE CITIZENS OF NEW MEXICO, AND THE COMPENSATION FEATURES UNIQUE TO NEW MEXICO AS THE HOST STATE OF THIS NATIONAL NUCLEAR WASTE FACILITY, ARE ABSOLUTELY ESSENTIAL ELEMENTS IN THE LAND WITHDRAWAL LEGISLATION TO BE CONSIDERED BY THE CONGRESS.

FINALLY, IN CLOSING, LET ME MAKE A BRIEF COMMENT ON THE DRAFT LAND WITHDRAWAL LEGISLATION PREPARED BY THE DEPARTMENT OF ENERGY FOR YOUR CONSIDERATION. THE STATE OF NEW MEXICO REGARDS THE DOE LAND WITHDRAWAL BILL AS SERIOUSLY DEFICIENT IN TERMS OF PROTECTING THE PUBLIC HEALTH, SAFETY AND THE ENVIRONMENT FROM THOSE RISKS POSED BY THE TRANSPORTATION, STORAGE AND DISPOSAL OF WASTES AT THE WIPP REPOSITORY. THE DOE'S PROPOSED WIPP LAND WITHDRAWAL LEGISLATION IS UNACCEPTABLE FOR THE FOLLOWING REASONS: IT CONTAINS FEW OF THE PROVISIONS CALLED FOR IN THE ATTACHED RESOLUTION OF THE WESTERN GOVERNORS' ASSOCIATION; IT CONTAINS FEW OF THE PROVISIONS INCLUDED IN PREVIOUS VERSIONS OF OUR CONGRESSIONAL DELEGATION'S WIPP LAND WITHDRAWAL LEGISLATION; AND IT CONTAINS FEW OF THE PROVISIONS NECESSARY TO SATISFY DOE'S LEGALLY BINDING, WRITTEN COMMITMENTS TO THE STATE OF NEW MEXICO, AS OUTLINED IN THIS TESTIMONY.

NEW MEXICO HAS INCLUDED AN ATTACHMENT TO OUR TESTIMONY WHICH OUTLINES THE KEY PROVISIONS WHICH MUST BE ADDRESSED IN THE LAND WITHDRAWAL LEGISLATION. NEW

MEXICO DEFERS TO ITS REPRESENTATIVES ON THIS COMMITTEE, SENATORS DOMENICI AND BINGAMAN, AND WILL CONTINUE TO WORK WITH OUR CONGRESSIONAL DELEGATION TO CONSTRUCT AN ACCEPTABLE BILL WHICH WILL NOT ONLY ENSURE WIPP IS OPENED AND OPERATED IN A SAFE MANNER, BUT WILL ULTIMATELY INSTILL A HIGH LEVEL OF CONFIDENCE IN THE REPOSITORY'S LONG-TERM INTEGRITY.

THAT CONCLUDES MY REMARKS ON BEHALF OF GOVERNOR CARRUTHERS AND THE STATE OF NEW MEXICO. THANK YOU FOR THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY.

## ATTACHMENT 1: Testimony of the State of New Mexico

Western Governors' Association
Resolution 89-006

July 18, 1989
Long Beach, California

SPONSOR: Governors Gardner, Carruthers, and Goldschmidt
SUBJECT: U.S. Department of Energy Waste Isolation Pilot Plant (WIPP)

A. BACKGROUND

1. Over the past 45 years, the United States has developed, produced, and tested nuclear weapons using a national network of facilities, including U.S. Department of Energy (DOE) sites in six western states. As a result, large quantities of radioactive and hazardous chemical wastes have accumulated. These wastes now pose serious immediate and long-term threats to the environment and the public health and safety.

2. At DOE facilities in western states, millions of cubic feet of transuranic wastes, some mixed with hazardous chemical wastes, await permanent disposal. Some is in retrievable temporary storage, but, prior to 1970, much was buried in shallow trenches or discharged as liquid, resulting in considerable contamination of soil and groundwater. More waste will be generated as the result of continuing weapons production work and the decommissioning and decontamination of aging facilities.

3. The Waste Isolation Pilot Plant (WIPP) in New Mexico is intended to serve as a permanent repository for selected defense-related transuranic wastes. Although major construction activities at the WIPP are largely complete, the opening of the facility has been delayed by a number of yet unresolved technical, administrative, safety, and environmental issues. Originally scheduled to open in late 1988, the WIPP may not be available until 1990.

4. The cleanup, transport, and permanent disposal of radioactive and hazardous chemical wastes at DOE facilities are issues of vital concern to the western states. In recognition of the scope of the waste problems and the risks they pose to the public and the environment, the western governors have urged the President and Congress to take prompt action to establish a comprehensive national program (WGA Resolution 89-004). As the only permanent repository for defense-related transuranic wastes, the WIPP is critical to the success of the cleanup effort sought by the governors.

B. GOVERNORS' POLICY STATEMENT

1. In keeping with the policies of WGA Resolution 89-004, it is the objective of the western governors to secure, through the expeditious resolution of outstanding technical, administrative, safety, and environmental issues, the earliest possible opening of the WIPP. The western governors are committed to working cooperatively with the Congress and DOE to achieve this objective.

2. The western governors believe that WIPP land withdrawal legislation is the most appropriate means to ensure that key issues relating to the opening and operation of the WIPP are satisfactorily resolved. Accordingly, the western governors urge the enactment in 1989 of land withdrawal legislation which contains the following provisions:

## ATTACHMENT 1: Testimony of the State of New Mexico

a. DOE must comply with all applicable federal and state environmental laws and regulations during WIPP's operational life, including the five year demonstration period. The EPA must review and concur with USDOE's determination of compliance with the environmental and disposal standards.

b. DOE must provide adequate compensation to the State of New Mexico for costs incurred as a result of its role as host of the WIPP repository.

c. DOE must comply with the applicable requirements of the Resource Conservation and Recovery Act (RCRA) and all corresponding regulations under the authority of EPA or the State of New Mexico, should the state be delegated authority.

d. Shipments of transuranic wastes to the WIPP from the Idaho National Engineering Laboratory, the Hanford Site and the Rocky Flats Plant must occur during the demonstration period. Shipments of transuranic wastes from USDOE facilities in other western states must be allowed if the necessary National Environment Policy Act (NEPA) documentation is prepared. Additionally, DOE must not ship any transuranic wastes to the WIPP from the Los Alamos National Laboratory until a by-pass around the City of Santa Fe is completed.

e. DOE and the other federal agencies must be directed to assist, cooperate with, and fund activities of corridor states to ensure:

   (1) Safe transport of transuranic wastes;

   (2) Emergency preparedness for and response to transuranic transport incidents; and

   (3) Public education and confidence in the safety of waste shipments.

   Federal funding must continue until all shipments have been completed.

   The western governors endorse the WGA Nuclear Waste Task Force's report to Congress which provides specific recommendations regarding the safe transportation of transuranic wastes to WIPP.

f. DOE must not at any time store high-level radioactive waste in the WIPP.

g. The current design capacity of the WIPP must not be increased unless:

   (1) DOE determines, through a detailed inventory and evaluation of transuranic wastes, that additional repository capacity is required; and

   (2) DOE completes the necessary NEPA documentation, complies with applicable regulations and determines to the satisfaction of the State of New Mexico that additional wastes can be accommodated safely.

h. The withdrawal of federal lands for the WIPP does not in any way establish a reservation to the United States with respect to any water or water rights.

i. DOE, in consultation with the State of New Mexico and the New Mexico State Office of the Bureau of Land Management, must develop a plan for the management and control of the WIPP withdrawal area after the decommissioning of the facility. The first draft of the plan should be submitted to the State at least five years prior to the closure of the WIPP.

j. DOE must receive U.S. Nuclear Regulatory Commission certification of the transportation containers for both the contact-handled and remote-handled transuranic (TRU) wastes prior to their use.

## C. GOVERNORS' MANAGEMENT DIRECTIVE

1. WGA shall convey this resolution to the appropriate members and committees of the Congress, Department of Energy, Department of Interior and the Environmental Protection Agency.

2. In accordance with the policy established by this resolution and WGA resolutions 88-001 and 89-004, the WGA Task Force is directed to work with the Congress and DOE to secure the enactment of legislation which will allow the earliest possible opening of the WIPP through the prompt resolution of outstanding technical, administrative, safety and environmental issues.

**ATTACHMENT 2: Testimony of the State of New Mexico**

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## KEY PROVISIONS: WIPP LAND WITHDRAWAL LEGISLATION

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- Impose a capacity limit on the total volume of waste to be emplaced in the repository. This limit should correspond to that capacity identified in the Final Supplement Environmental Impact Statement, Waste Isolation Pilot Plant (DOE/EIS-0026-FS, January 1990).

- Require the U.S. Environmental Protection Agency (EPA) to determine if and when the DOE has complied with federal storage and disposal standards for transuranic waste repositories (40 CFR 191, Subparts A and B).

- Prohibit experimentation with, and disposal of, high-level waste at WIPP.

- Impose a specific limit on the volume of waste brought to WIPP for the proposed experiments during the 5-year Test Phase. The comments and recommendations of independent peer review groups must be given significant weight in determining the appropriate waste volume.

- Direct DOE to perform retrievability demonstrations on an annual basis until such time as EPA verifies DOE's compliance with newly promulgated federal disposal standards for transuranic waste repositories (40 CFR 191, Subpart B).

- Prohibit the conduct of an "Operations Demonstration" at WIPP until such time as the EPA verifies DOE's compliance with newly promulgated federal disposal standards for transuranic waste repositories (40 CFR 191, Subpart B).

- Provide adequate compensation to the State of New Mexico for costs incurred in its role as host state. (At a minimum, $250 million plus release of the $43 million already appropriated.)

- Require the U.S. Nuclear Regulatory Commission to perform quality control/quality assurance inspections of all WIPP transportation packaging containers.

- Condition the permanent withdrawal of federal land for the WIPP Project on EPA's verification of DOE compliance with newly promulgated federal disposal standards for transuranic waste repositories (40 CFR 191, Subpart B).

- Authorize the appropriation to DOE of such funds as necessary to provide in-kind and cash assistance to corridor states and Indian Tribes for transportation safety activities, including those relating to accident prevention and emergency response.

- Authorize the appropriation to DOE of such funds as are necessary to acquire interests in an existing federal potash lease held by International Minerals and Chemical Corp. (#NM0384584).

Senator **Bingaman**. Thank you very much, Secretary Lockwood.

Our final panelist on this panel is Robert Neill, who is head of the Environmental Evaluation Group.

We are very pleased to have you here. Go right ahead.

## STATEMENT OF ROBERT H. NEILL, DIRECTOR, NEW MEXICO ENVIRONMENTAL EVALUATION GROUP

Mr. **Neill**. Thank you, Mr. Chairman and members of the Committee. My background in radiation and protection covers about 34 years now, and I have served as an advisor to diverse groups such as the Congressional Office of Technological Assessment, the National Academy of Sciences, the World Health Organization, State of Tennessee, the Sierra Club as well as the Battelle Laboratories——

Senator **Bingaman**. You might just pull that microphone a little closer, if you could.

Mr. **Neill**. The New Mexico EEG was established in 1978 to conduct an independent technical evaluation of the health and safety impact to the people of New Mexico from the proposed WIPP project. It is the only full-time non-DOE review group overseeing WIPP.

Our work, which includes environmental monitoring both on site and off site, has been funded 100 percent by the DOE and we are currently at a level of about $1.5 million per year.

EEG's responsibilities in this area are particularly important since Congress exempted defense TRU waste disposal from NRC licensing but required such NRC licensing for both defense high level waste and defense uranium mill tailings.

EEG owes a very special debt to Senator Bingaman and Senator Domenici, who introduced legislation to reestablish our technical independence and, of course, to the Congress for passing that legislation.

While TRU waste disposal was handled similarly to low level waste before 1970, it has subsequently been considered to have an overall toxicity more comparable to high level waste, and standards that have been developed by EPA for disposal are identical for both waste types. Also, DOE's plans require similar geological isolation for disposal of both TRU and high level wastes.

One of the questions that comes up: Is WIPP safe? The demonstration of safe management of these materials is quite different than the demonstration of safe disposal. For disposal, DOE has scheduled compliance with the EPA standards of Subpart B in late 1994, and until that occurs it is scientifically and administratively speculative to state it is safe for disposal.

With respect to the management of these wastes, it has been pointed out earlier this afternoon, that considerable experience has been developed at the various waste-generating sites since 1970 in placing more than 200,000 drums of transuranic waste, measuring the radioactivity, transportation to Idaho and storage.

WIPP, however, has not completed all of the necessary required radiation protection activities. We do believe that they can be eventually completed at WIPP.

With respect to the decision plan that was mentioned earlier this afternoon, DOE has not yet replied to our concerns. I might mention two of the more significant ones. We have pointed out that they have a very overly optimistic date of February 1991 for a decision on waste form modification, despite the fact that the Secretary only three weeks ago said it would probably take anywhere from three to five years to make that decision. Again, the plan has not been updated.

Other areas include the availability of a report on waste characterization for experiments. This is a very vital and necessary report and documentation to have in considering the experiments at WIPP.

Another question relates to how much waste should be brought to WIPP before demonstrating compliance with Subpart B of the EPA standards. The total amount that has been identified by the Department of Energy for bin and alcove experiments in support of performance assessment is 4,500 drum equivalents, 0.5 percent, and we believe that that should be regarded as an upper limit until completion of the demonstration of the compliance with these standards, now slated for late 1994.

In addition to assuming the ability to obtain good data with these experiments in a timely manner, and we have concerns on that, we believe that experiments to address the prevention of gas generation as well as the dissipation of gas after being produced will be more helpful and should be put in a higher priority than the current plans.

The determination of any required waste form modification in order to meet the standards is probably the most important issue, and clearly, Mr. Chairman, you have recognized that today. And we believe this is dependent on the ability to predict the room dynamics that address the interdependence of both gas and brine quantities.

Basically, the extent of modification required will be a function of how much gas will be produced. The amount of gas, in turn, is a function of the amount of brine that will be in the room. The amount of brine is a function of the room dynamics and the models, and it will not be obtained through experiments; it will be obtained through analyses.

With respect to the EPA recommendation to emplace 1.5 percent in two rooms, we see no justification for this whatsoever. The parameters that were identified have nothing to do with waste. They include the room deformation, brine inflow, gas flow, permeability, porosity of the rock, temperature and humidity. These do not require waste, and we believe that any long-term monitoring such as this should not occur under after the decisions on waste form modification, backfill and any repository design conditions have been met.

With respect to the remote-handled transuranic waste, which comprises 5 percent of the total radioactivity and can go as high as 1,000 rem per hour, we do not see any reason to bring any, and DOE has not identified any experiments with that waste form.

Regarding the operational demonstration, again, we do not see any purpose in bringing TRU waste to WIPP for operational demonstration before meeting the standards. There is a detailed list, but fundamentally, there is little technical knowledge to be obtained in conducting such activities. We have certainly handled more than 200,000, as has been pointed out today, since 1970, and the emplacement of a large amount of drums before making a decision on the need for any processing might require transportation exposures to workers if treatment is required.

You will either have to build a facility at WIPP or waste would have to be transported back to Rocky Flats or to Idaho or to some other point for processing.

Senator DOMENICI. Mr. Chairman?

Senator BINGAMAN. Excuse me. Senator Domenici?

Senator DOMENICI. Mr. Chairman, I just received a note that Chairman Sasser is starting to mark up one of the provisions on the budget, and I have to leave. I wonder if I could take 30 seconds. I am not going to ask any questions.

Senator BINGAMAN. Certainly. Could we just interrupt a moment here?

Senator DOMENICI. I want to thank the three witnesses. I hope to be able to return before we are finished, but, Madam Secretary, your testimony was excellent and we really appreciate your coming up here.

And, Mr. Mayor, we are delighted to have you here. I think you contributed to our discussion in a very meaningful way, and I think you too have the exact same goals that we want: a facility that meets the health and safety standards set by this Nation. And I compliment you on what you have been doing.

And of course, last but not least, Bob, you and your group are doing exactly the job that we thought EEG would do when we built into the original statute the one exception, the only state in the union that got the privilege of having consultation and cooperation. And that is the agreement that creates you and that gave New Mexico authority to insist on being involved.

I thank you. I have read your testimony and talked with you yesterday. Thank you very much.

Thank you, Mr. Chairman.

Senator BINGAMAN. Sure, thank you.

Mr. Neill, why do you not go ahead and complete your testimony?

Mr. NEILL. Thank you, Mr. Chairman.

Another question relates to: Must the experiments be conducted at WIPP? The rationale provided for DOE for the measurement of gas is to provide an environment similar to the repository, make use of the existing work force and facilities and conduct the experiments in one place.

The advantages to conducting the alcove tests at WIPP which are intended to address the dissipation of gas into the rock. With respect to the bin experiments, other than temperature and humidity which can be developed elsewhere, the bin experiments are independent of repository interactions.

Now since the Department has expressed a need to obtain data on the rates of gas generation and the latest gas measurements were taken at Idaho in 1985, and the earliest date to begin shipment to WIPP is still unknown, we have urged DOE since mid-1989 to begin measuring gas at the generating sites and thus avoid any delay.

Hence, we believe that DOE could be obtaining data now for performance assessment. Some of the problems that have yet to be resolved for the experiments is (1) a successful seal for the alcoves in order to measure gas, (2) it is necessary to identify a site for the solubility experiments which cannot be conducted at WIPP since the facility has not been designed to deal with plutonium sampling of liquid samples.

Third, while the Department wishes to use waste from Rocky Flats and Idaho for the experiments, it may be some time after the first of the year before waste at those locations can be transferred from drums to bins, and fourth, it is necessary to resolve the thinning of the steel plate problem which has occurred in 15 TRUPACT shipping containers during construction, to less than the required thickness.

Now, when will WIPP be ready to dispose of TRU waste? And disposal, which we know is a definition with no intent to retrieve, cannot begin until after late mid-1994, the date of the demonstration of compliance.

The preliminary analyses, as indicated earlier today by Sandia, suggests a high likelihood of the need to modify the waste form, to either change the rate of gas generation through compaction and shredding or to eliminate the gas totally through vitrification and incineration in order to meet the standards.

Since it may require several years to design, construct, license and test such a facility, a decision made in 1993 may not have waste available until some time after 1994.

Now what needs to be completed? We received a request, Mr. Chairman, last summer by Senator Domenici in which we identified a number of scientific stipulations to be met prior to the completion of the first shipment of waste, and I would like to simply include that entire list for the record. But I would like to note that out of the 14, only one has been satisfactorily closed, which is the issuance of a supplement to the environmental impact statement.

With your permission I would like to comment on three of those. One is to publish a report showing the status of compliance with Subpart B of the standards for the human intrusion scenario involving gas and brine. At the present time, no good model exists to be able to predict the time at which brine would enter the repository, which can then interact with the waste form and with the drums to produce gases.

Also, the final safety analysis report does not include an analysis of all safety issues that were identified in the consultation and cooperation agreement. EEG agreed with the Department's position that these can be addressed in other documents to be published.

However, to avoid undue expectations by the public, that the safety analysis report contains analyses of the safety of all WIPP activities, we have urged the Department to include a preface to the document stating flatly, clearly and unequivocally that the document does not include an analysis of the safety of long-term disposal, nor the safety of the test phase experiments to the workers, nor does it include an analysis of the operational readiness of WIPP to receive waste.

The system at the generating sites has been to rely upon those to provide measurements of the radioactivity in the waste to come to WIPP. It is a self-certification system. These are scheduled to have annual audits by the Waste Acceptance Committee, of which EEG is a member. Unfortunately, the last audits were not held since January 1989, and they are not scheduled again until January 1991, which would be a two-year hiatus.

It is interesting, I just calculated, Mr. Chairman, that the amount of plutonium that has been recently reported in the air ventilation duct work at the Rocky Flats plant, which is 28 kilograms, is not that much different from the amount of plutonium to be contained in the drums to be shipped to WIPP for the experiments for the first five years.

There is no data on the particulate size, but if one were to correct for the respirability of these wastes, the number would be even higher. Now, while we expect that that plutonium will probably be recovered and not shipped to WIPP, the comparison is intended to provide a perspective on the need of a plan, which is still not yet available, to create confidence that the measurements of TRU waste for WIPP are correct through a formal system of verification.

And lastly, Mr. Chairman, we have recommended that the DOE delay issuance of the WIPP record of decision that the facility is ready to receive waste until a number of items are completed: (1) completion of an operational readiness report to demonstrate that the facility is ready to safely handle radioactive materials; (2) an analysis of the engineering modification options and their incorporation in the test plan; (3) acquisition of the mineral lease at the site; (4) resolution of the retrievability and retrieval options; (5) completion of NEPA documentation for the generator sites; and (6) resolution of the waste certification and verification at the Rocky Flats plant.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Neill follows:]

# STATEMENT OF

## ROBERT H. NEILL

## DIRECTOR

## NEW MEXICO ENVIRONMENTAL EVALUATION GROUP

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

APRIL 26, 1990

Mr. Chairman, Members of the Committee:

## Background

The New Mexico Environmental Evaluation Group (EEG) was established in 1978 to conduct an independent technical evaluation of the health and safety impact to the people of New Mexico from the proposed WIPP Project. It is the only full-time non-DOE review group overseeing WIPP, and to date we have published 45 major reports of our analyses. Our work, which includes environmental monitoring on-site and off-site, has been funded 100% by the DOE.

EEG's responsibilities are particularly important since Congress exempted defense transuranic (TRU) waste disposal from NRC licensing, but required NRC licensing for both defense high level waste and defense uranium mill tailings.

EEG owes a special debt to Senator Jeff Bingaman and Senator Pete Domenici who introduced legislation to re-establish EEG's technical independence and of course to the Congress for passing that legislation in PL 100-456 in October 1988.

While TRU waste disposal was handled similarly to Low Level Waste (LLW) before 1970, it has subsequently been considered to have an overall toxicity more comparable to High Level Waste (HLW) and standards developed by EPA for disposal are identical for both waste types. Also, DOE's plans require similar geological isolation for disposal of both transuranic and high-level wastes.

## Is WIPP safe?

The demonstration of safe management of these radioactive materials is quite different than the demonstration of safe disposal. For disposal, DOE has scheduled the demonstration of compliance with the EPA standards in mid-1994. Until that occurs, it is scientifically and administratively speculative to state that it is safe for disposal.

With respect to the management of such wastes, considerable experience has been developed at the various waste generating sites in placing TRU waste in 200,000 drums and boxes, measuring the radioactivity, transportation and storage. WIPP, however, has not completed all required radiation protection activities. The continuous air monitors for the detection of radiation have yet to be made fully operational and tested for sensitivity. DOE has not turned over the monitoring station to EEG that they agreed to provide in the Consultation and Cooperation Agreement between NM and DOE. Standards for occupational protection and radiation protection exist and we do believe that the necessary radiation protection activities can eventually be established at WIPP.

## Decision Plan

While DOE has responded to many of our comments on the various Drafts of the Decision Plan on WIPP, DOE has not yet replied to our March 23, 1990 letter citing concerns on operational readiness, availability of the report on waste characterization for experiments, the overly optimistic date of February 28, 1991 for a decision on waste form modification and lack of specificity on retrievability plans.

## How much waste should be brought to WIPP before demonstrating compliance with the EPA standards?

### CH-TRU Waste Experiments

The total amount of CH-TRU waste that has been identified by DOE for experiments in support of performance assessment is 4,500 drum-equivalents (0.5%), and that should be regarded as an upper limit until completion of the demonstration of compliance with standards for safe disposal. In addition to assuming the ability to obtain good data in a timely manner, we believe experiments to address the prevention of gas generation and the dissipation of gas after being produced will be more helpful and should be conducted.

The determination of any required waste form modification in order to meet the standards is probably the most important issue and will be dependent on the ability to predict room dynamics that address the interdependence of gas and brine quantities and rates. This will be determined by analyses of models and not by experiments.

We see no reason for the emplacement of 13,500 drums (1.5%) in two rooms as recommended by EPA before demonstrating compliance with 40CFR191, since no justification nor analyses have been provided by DOE. The parameters identified by EPA to be studied (room deformation, brine inflow, gas inflow from the rock, temperature and humidity) do not require waste, and the long-term monitoring should not begin until after the decisions on waste-form modification, backfill and repository design changes have been made.

**RH-TRU Waste Experiments**

**Since DOE has not identified any need for experiments with Remote Handled Transuranic (RH-TRU) waste, none should be permitted.**

## Operational Demonstration

We do not believe that any TRU waste should be brought to WIPP for operational demonstration prior to proving that the facility can meet the EPA Standards for safe disposal of transuranic waste for the following reasons:

1. There is little technical knowledge or experience to be gained in conducting waste handling activities at WIPP before determining whether it is necessary to modify the waste form or the repository design. Waste certification is occurring at the generating sites as is packaging and waste handling. DOE has transported more than 200,000 CH-TRU waste drum-equivalents from the generating sites to INEL since 1970.

2. The emplacement of a large number of drums before making a decision on the need to process wastes (e.g., cementation, crushing, incineration, vitrification, etc.) could result in needless transportation and operations related occupational radiation exposure. If treatment is required, a facility would have to be built for this purpose at WIPP, or waste would have to be transported back to Rocky Flats or elsewhere for processing

3. Until DOE commits to actual waste emplacement conditions including backfill, getters, or other engineering modifications, waste emplacement will not represent actual

conditions. And these commitments will need to be based on the results of the performance assessment.

4. Operational demonstration is unrelated to the demonstration of compliance with the disposal requirements of the EPA Standards.

5. If the scientific experiments with 4,500 drum-equivalents are conducted, it will require more than 100 truck shipments. Unloading more than 300 TRUPACTS and moving the material through the system will provide considerable operational experience.

6. It is important to demonstrate an ability to emplace increasing amounts of waste safely, but we see no purpose to doing it twice, now and when the disposal phase begins.

7. DOE has not identified any need to conduct operational demonstrations at the HLW facility in Nevada and has no plans to do so prior to demonstrating compliance with the EPA and NRC Standards for disposal. Experiments and operational demonstration with HLW at the Climax Mine in Nevada involved a dozen shipments, which is insignificant compared to the 1,500 planned shipments to WIPP for operational demonstration.

Must the experiments be conducted at WIPP?

The rationale provided by DOE to conduct experiments for the measurement of gas production in-situ at WIPP is to provide an environment similar to the repository, make use of the existing work force and facilities, and to conduct the experiments in one place. The reasons cited are more related to logistics, economics, availability of facilities and permitting. There are advantages in conducting the alcove tests at WIPP which are intended to address the dissipation of gas into the rock. Other than temperature and humidity, the bin experiments are independent of repository interactions.

Since DOE has indicated a need to obtain data on the rates of gas generation, and the earliest date to begin shipment is still unknown, EEG has urged DOE since mid-1989 to begin measuring gas at the generating sites to avoid any delay in obtaining the information. This is particularly important for the high curie plutonium 238 heat source radioactive wastes at Los Alamos National Laboratory and the Savannah River Plant which are not authorized for shipment by NRC to WIPP. Hence, we believe DOE could be obtaining data now for performance assessment.

Problems that have yet to be resolved include:

1. Successful seal for the alcoves to be able to measure gas.

2. Identification of a site to perform the solubility tests of the transuranics with brine since WIPP was not designed to permit sampling of plutonium contaminated liquid samples.

3. While DOE wishes to use waste from Rocky Flats and INEL for these experiments, it may be after the first of the year before waste at those locations can be transferred from drums to bins.

4. Resolution of the thinning of the steel plate in 15 TRUPACT shipping containers during construction to less than the required thickness.

## When will WIPP be ready to dispose of TRU waste?

Disposal (with no intent to retrieve) cannot begin until after mid-1994; the scheduled date by DOE to demonstrate compliance with the EPA safety standards. Such demonstration requires analytical calculations to predict the long-term behavior of the radioactive actinides in returning to the biosphere. Preliminary analyses by Sandia suggest a high likelihood of the need to modify the waste form to either change the rate of gas generation (compaction, shredding) or eliminate the gas (vitrification, incineration) in order to meet the standards. Since it may require several years to design, construct, license, and test such a facility, a decision made in 1993 may not have waste available for shipment for some time after 1994.

## What needs to be completed?

In response to a request by Senator Pete Domenici, in September 1989 EEG identified a number of scientific stipulations to be met prior to the first shipment of waste to WIPP. The following have yet to be resolved:

1. Complete the EPA approval of a variance petition of no migration of the mixed wastes slated for WIPP in order to ship representative mixtures of waste for experiments.

2. Publish a report summarizing the status of compliance with Subpart B of the EPA Standards for the human intrusion scenario involving gas and brine. No progress has been reported yet in the Assurance Requirements of the Standard which do not require quantification.

3. Identify and begin tests and analyses designed to deal with gas generation in the repository from radioactive waste.

All estimates indicate that the expected amounts of gas will require engineering modifications to either prevent the generation or to reduce the amount of gas after generation.

4. While progress is being made daily, the facility is not yet operationally ready to receive wastes for the following reasons:

   - The airborne radioactivity detection equipment has not yet been proven capable of detecting radiation underground with the necessary sensitivity.

   - Radiation protection operating procedures have not all been completed and verified including off-site dose estimates for emergency response.

5. The Final Safety Analysis Report (Final SAR) has not been completed and published. The 1981 NM/DOE Consultation and Cooperation Agreement contains detailed requirements as to the content of the document. Although the SAR does not address all safety issues, EEG agreed with DOE's position that they can be addressed in other reports to be published by DOE. In order to avoid undue expectations by the public that the Final SAR contains analyses of the safety of all WIPP activities, EEG has urged DOE to include a preface stating that the SAR does not include the following:
   - An analysis of the safety of long-term disposal.
   - An analysis of the safety of the test phase experiments.
   - An analysis of the operational readiness of WIPP to receive waste.

6. The Supplement to the Environmental Impact Station (SEIS) has been issued.

7. Technical concerns on the ability to get meaningful data from alcove tests need to be addressed and approved.

8. Purchase the existing mineral lease at the site.

9. Aid the State in designating "Preferred Routes" in the context of 40 CFR 177.825.

10. If measurements of gas production from CH-TRU wastes cannot begin at WIPP this year, and results are needed as soon as possible, conduct some tests at generating sites such as

    - Rocky Flats Plant (RFP) and Idaho National Engineering Laboratory (INEL) for weapons grade plutonium wastes, and

    - Savannah River Plant (SRP) and Los Alamos National Laboratory (LANL) for heat source plutonium wastes.

    Last gas measurements were made at INEL in 1985.

11. EEG needs to receive the validation plans for Rocky Flats Plant and the other waste generators to provide assurance that waste from the generating sites does meet the acceptance criteria for WIPP. The system relies on self certification measurement by the generators with an annual visit by the WIPP Waste Acceptance Criteria Committee to review their procedures. Unfortunately, the last WIPP audits of RFP and Idaho National Engineering Lab (INEL) occurred in January 1989 and are not scheduled again until January 1991 -- a 2 year interval.

    The amount of plutonium recently reported in the air ventilation duct work at the Rocky Flats Plant (RFP) is 28 kilograms. Since the transuranic waste from RFP scheduled to be shipped to WIPP contains 7.5 grams Pu/drum, the duct work appears to contain the equivalent plutonium found in 3700 drums of RFP WIPP waste. That is not much different from the 4500 drums (0.5%) requested by DOE for bin and alcove experiments during the first five years.

While there are no data on the particle size distribution of the plutonium in the RFP ducts, the amount of inhalable plutonium at RFP appears comparable to the 21 kilograms of inhalable plutonium expected to be present in the 2 million cubic feet of TRU waste (290,000 drums) to be shipped to WIPP from RFP over the next 25 years. And two-thirds of that waste is yet to be generated.

While this plutonium will probably be recovered and not shipped to WIPP, the comparison is intended to provide a perspective on the need of a plan (which is not available) to create confidence that the measurements of TRU waste for WIPP are correct by a formal system of verification.

12. State of New Mexico must receive a delegation of authority from EPA to regulate mixed waste shipments for WIPP and then approve DOE Part B Application.

13. Publish plans for alternate disposal of wastes brought to WIPP during first five years if facility does not meet EPA Standards for disposal.

14. Complete NEPA documentation for the Los Alamos National Laboratory in order to ship waste from the facility.

Subsequent items include:

15. Completion of administrative procedures by the State of New

Mexico to require the commercial common carrier to only use specified routes for the 25,000 shipments to WIPP.

16. An analysis of the radiation risk to the workers associated with the experiments involving 4500 drums (0.5% by volume of CH-TRU).

17. Resolution by NRC of the thinning of the TRUPACT pressure vessels steel plate during manufacture.

18. Record of Decision

    We have suggested that DOE delay issuance of the WIPP Record of Decision until the following items are completed and the issues resolved:

    - Completion of Operational readiness issues and a report to demonstrate the facility is ready to safely handle radioactive materials.
    - Analysis of engineered modification options and their incorporation in the test plan.
    - Acquisition of the mineral lease on the site.
    - Resolution of retrievability and retrieval options.
    - Completion of NEPA documentation for the generator sites.
    - Resolution of waste certification verification at the Rocky Flats Plant.

Senator BINGAMAN. Thank you very much.

I appreciate all of the testimony, and I think it has been very useful.

Let me ask a few questions if I could on a couple of issues, just to clarify my own understanding of it.

The testimony, Mr. Neill, that you have given here as to whether or not experiments need to occur at the site. As I understand it, you say that there is a justification for doing the alcove experiments at the site and you support that. Is that correct?

Mr. NEILL. Yes, sir.

Senator BINGAMAN. On the issue of the bin experiments, or the tests that are referred to as the bin tests, I understand now—am I right—that those are the tests that involve gas generation?

Mr. NEILL. Well, actually, Mr. Chairman, they all do. The intent on the bins are to put six drums of a given waste form in a bin and then measure the composition and rate of gas generation of the different gases.

Senator BINGAMAN. Okay. Is it your view that the bin tests do not need to be done at the site, could be done elsewhere, and that is what you have been urging DOE to proceed with at another location for the last year and a half? Is that accurate?

Mr. NEILL. Yes, sir, that is correct. Even today we do not have a date at which these waste materials could be sent to WIPP for experimental purposes. And if the clock is delayed, and I will not try to predict what the delay in the clock would be to start that, we think it makes more sense to begin obtaining those measurements now.

Senator BINGAMAN. Here is what I am trying to get at. I have gathered from your testimony and from Dr. Kubo's testimony a little earlier, that it is your view that perhaps they should go ahead and move up the time to make a decision on whether to treat or modify the waste, that three to five years is not a reasonable—that if we do this in sequence, as Dr. Kubo put it, we may unnecessarily prolong this process. Is that part right?

Mr. NEILL. Yes, sir. And Dr. Kubo's remarks regarding the schedules are right on target if they are done sequentially. The difficulty comes in determining at this point the extent of waste form modification, whether one could get by with shredding, compaction or some modest effort which would only change the rate of gas generation.

If it requires heroic measures, such a vitrification and incineration, we simply do not have the information at this point to be able to make that prediction and decide on the form of modification. It is sort of a Catch-22 problem.

Senator BINGAMAN. If DOE did want to accelerate the decision making about whether they were going to have to modify or treat the waste, how could they proceed to do that? I mean, would their response back to us be that until they can put waste at the site and go forward with the tests that they have identified, they are not going to be able to make that decision?

Mr. NEILL. I think the important effort which DOE and Sandia is pursuing is to accelerate, insofar as much as possible, the analyses required to predict the performance of the WIPP repository, namely of the gas.

And that will be done through the generation of models and calculations. The data to be obtained through the experiments will be of rather limited value in that endeavor.

Senator **Bingaman**. So you are saying that their ability to accelerate the decision making really is not dependent upon their doing these tests at the site?

Mr. **Neill**. That is correct. Now we are working very closely with DOE and in fact, we have arranged to have one of our modelers work behind the fence with the people in Sandia. We will be reporting separately, however. We are doing that in a cooperative venture in trying to get the information as quickly as possible.

Senator **Bingaman**. You said over here on this record of decision on page 12 of your testimony you list six items there that need to be resolved, six issues that need to be completed or resolved before a record of decision should be issued, as I understand it.

Are those also—I guess, the first question is, when do you think realistically we could expect those six items to be completed?

Mr. **Neill**. Mr. Chairman, that is difficult for me to predict. If you ask me when DOE would have acquired that mineral lease on the site three years ago, I would have said they would have acquired it within six months. And it is very difficult to predict the completion date for these.

On a positive note, our comments on the decision plan, that DOE is accelerating their responses and have provided a commitment just last week to try to respond in a more rapid manner for these comments.

Senator **Bingaman**. I guess what I would ask you or Secretary Lockwood, any of you here, is there a finite list of items which—Senator Domenici was referring to the plan which DOE has come out with and indicated that one point of view would be that Congress should not withdraw the land until all the items on that plan had been completed.

If a smaller and more finite list of key activities or key items were to be drawn up that needed to be completed before Congress would be sufficiently satisfied that it should withdraw the land, what would that list consist of? Did you have any thoughts on that?

Mr. **Neill**. Mr. Chairman, we think that as a minimum the items that were identified here in the record of decision on number 18 of my testimony is a reasonable list. And we also think that those listed on the 14 points earlier in the testimony comprise additionally a reasonable list, and progress should clearly be indicated on each of those, if not totally completed in our judgment.

Senator **Bingaman**. So you would say the 14 plus the six that you list on page 12 under item 18?

Mr. **Neill**. Yes, the six on 12 under the record of decision are repeated in part under the other. So they do mesh together.

Senator **Bingaman**. But you would say that those should either be completed or substantial progress made on those before the appropriate level of confidence would be there that would justify going forward, is that your view?

Mr. **Neill**. Yes, sir.

Senator **Bingaman**. Okay. Secretary Lockwood, did you have a view on that?

Ms. **Lockwood**. Mr. Chairman, I do not have a copy of Mr. Neill's testimony so I am not sure what he is referring to. But it sounds to me in listening to it like those are a number of elements within a number of the major decision points that the DOE plan has addressed. And again, I am looking at this little chart that Senator Domenici was referring to.

There are two boxes here that really outline what the DOE decision plan states needs to happen before any waste is received at WIPP for the testing phase. We agree with those. One of those happens to be the land withdrawal bill. The timing of the land withdrawal bill I think is the issue here.

Let me just say from our point of view, we, again, do not want to see any administrative land withdrawal proceed. I have a copy of a February 15 letter from Secretary Lujan to Secretary Watkins that again is discussing the administrative land withdrawal.

We are very much opposed to that. We want to make sure that there is a legislative withdrawal. And whether such a bill proceeds in parallel while a number of these other issues are being addressed or includes certain contingencies or conditions, so that withdrawal does not actually happen until all of these prerequisites are completed, we will essentially defer to your legislative judgment and that of Senator Domenici. But we believe that the decision plan that DOE has put together clearly outlines what we consider to be the critical prerequisites.

Senator **Bingaman**. Mr. Neill, let me just ask, if DOE set its mind to accelerating this decision point on whether to modify or treat this waste, how quickly in your view could we expect that decision point to be reached?

Mr. **Neill**. Mr. Chairman, that is a difficult one. One of the things I have tried to avoid on the 12 years on this project was not to come up with estimates of points that DOE would make whether it was the receipt of waste or other deadlines.

We think that the efforts of DOE to accelerate and work on the performance analysis is really crucial. I believe right now that Sandia has 90 man-years of effort invested in that one area, which is really key to demonstrating compliance with the standards.

I think that within, however, perhaps two years minimum or three, DOE would be in a position to be able to make a determination of the extent of any necessary waste form modification.

Senator **Bingaman**. In two years, was that your statement?

Mr. **Neill**. Perhaps, or three years, in a three-year time frame they could do that.

Senator **Bingaman**. All right.

Well, I think all the testimony has been very useful, and we appreciate it very much. We have one more panel to hear from in today's hearing. I am sure there will be additional opportunities for calling on each of you. Thank you all very much for being here.

Let me ask our third panel to please come forward: Michele Merola, who is the Executive Director for the Concerned Citizens for Nuclear Safety in Santa Fe, and Don Hancock, who is the Director of the Nuclear Waste Safety Project with the Southwest Research and Information Center in Albuquerque.

Why do we not go ahead with your testimony first, Michele? Thank you for being here.

## STATEMENT OF MICHELE MEROLA, DIRECTOR, CONCERNED CITIZENS FOR NUCLEAR SAFETY

Ms. MEROLA. Thank you, Mr. Chairman. I am glad to have the opportunity to testify here today. I am the Director of Concerned Citizens for Nuclear Safety, a citizen action group based in Santa Fe, New Mexico and representing thousands of citizens.

As our name implies, our primary focus is nuclear safety and as such, the WIPP project has been the subject of extensive study by our group. Over the past few years, people in New Mexico have taken the time to educate themselves about WIPP and are closely following this issue.

Our citizens are well informed and very aware that much of the so-called technical justifications intended to prove WIPP will be safe are only ill-disguised politics masquerading as science. If we peel our way through the layers of public relations and pseudo-scientific verbiage cloaking WIPP, we discover a constantly evolving understanding of the site. This new information belies the suitability of WIPP to safely isolate radioactivity from the environment.

We now know that, amongst other problems, the site is situated over a pressurized brine reservoir and beneath an aquifer, and that there is a significant amount of brine seepage into the site. Gas generation is a major problem. The host rock is fracturing, and salt creep is occurring at three times the expected rate.

We have effectively backed ourselves into a corner by relying solely upon WIPP to relieve our nuclear waste woes, but rather then do the logical thing and diversify our search for a possible solution, DOE doggedly persists in throwing good money after bad, trying to force a square peg into a round hole, refusing to acknowledge the obvious, that WIPP is more of a problem than a solution, the latest plan of action for expediting WIPP's opening is the test phase.

Although at first glance, testing the site seems like a responsible thing to do, the test plan raises more questions than answers. In the first place, the majority of the proposed tests do not require the presence of radioactive wastes at the site at all.

Those few tests which do require actual waste such as gas generation would be much more efficiently performed in a laboratory. In the interest of retrievability, drums placed in alcoves will not be breached. The degree ~~of~~ room closure in five years will be minimal.

Despite evidence that levels of gas generation are greatly affected by varying waste types, only waste from Rocky Flats and the Idaho National Engineering Laboratory would be used for testing.

These tests will in no way approximate realistic room conditions over thousands of years and cannot generate meaningful data. And it is merely coincidence that waste for testing would be from the two very facilities whose waste backlog triggered the supposed waste disposal crisis in the first place?

There is no real scientific justification for the emplacement of radioactive waste at WIPP for this test phase. There is considerable political pressure right now to pass a land withdrawal bill in order to start testing. Given the shaky foundation upon which this test plan is built, it seems merely a convenient strategy to get a foot in the door at WIPP, bypass environmental safety laws and relieve the pressure at Rocky Flats and INEL. No land withdrawal must be passed on this dubious basis.

Citizens and a few brave legislators have demanded that WIPP meet all EPA standards before any waste is emplaced—even for a test phase, but DOE has insisted that the test phase is necessary to prove compliance with EPA standards. Yet at a similar facility intended for commercial radioactive waste, Yucca Mountain in Nevada, DOE is required to demonstrate compliance with the identical regulations before any waste is emplaced.

It remains unclear why testing is necessary to demonstrate compliance at WIPP but not at Yucca Mountain.

There is no contingency plan if tests should fail at WIPP, and there is in fact considerable evidence that WIPP will not be able to meet safety standards.

Furthermore, not only does DOE claim they do not need to meet EPA standards for the test phase, they have also applied for a variance through another key environmental safety law, the Resource Conservation and Recovery Act.

Since WIPP is specifically exempted from NRC regulation, we are asked to rely upon DOE itself to certify compliance with these environmental laws. Self-certification must be based upon a solid foundation of trust. Quite frankly, the Department of Energy has failed to earn that trust.

The DOE's legacy of environmental contamination and gross disregard for human health and safety at every one of their facilities, requires an end to this self-regulation. The citizens of New Mexico demand EPA certification of compliance with safety laws at the WIPP site.

In sum, it is time we recognized that WIPP is not a viable solution to the increasing volumes of nuclear waste in this country. If WIPP were to open it would hold only 21 percent of the DOE's current transuranic waste inventory, nor is the waste slated for WIPP the waste that is currently wrecking havoc on the environment and human health.

The waste to which we should be directing our primary attention is the waste which for years has been dumped into pits, ponds, trenches, stored in leaking underground tanks and even intentionally injected into deep wells. WIPP does not address the real nuclear waste problem.

It is also important that we remember WIPP's status as a pilot project, setting the standard for nuclear waste disposal in the future. We find it alarming that this unproven and trouble-ridden project is being utilized as a model of the state-of-the-art technology for college students in waste management programs. This is like students in maritime engineering utilizing the Titanic as a prototype of an unsinkable ship.

Westinghouse has a team of 20 public relations people in Carlsbad. WIPP would sell itself without all of this marketing hype if it were scientifically viable.

You are dealing with an increasingly educated populace when it comes to nuclear waste. Extensive PR efforts, exemptions from Federal law and empty assurances of safety will not stop the WIPP site from ultimately leaking. People know this.

You must recognize that peoples' fears are legitimate, that they have learned from the experiences of those living in the shadow of Rocky Flats, Hanford, Savannah River and other DOE embarrassments.

Of course, nothing can be guaranteed 100 percent safe. The real question is whether it is necessary to create the risk at all. This is not anti-nuclear hysteria. This is people taking responsibility for the future.

CCNS proposes that any land withdrawal is unacceptable at this time and demands that all environmental safety standards be met at WIPP with no exceptions before any waste goes to the site. If WIPP cannot meet these requirements, then it is time for us to seriously reevaluate our national nuclear waste policy.

Thank you.

[The prepared statement of Ms. Merola follows:]

CCNS
Concerned Citizens for Nuclear Safety

**Michele Merola**
on behalf of
*Concerned Citizens for Nuclear Safety*

## Testimony before the Senate Energy and Natural Resources Committee

**April 26, 1990**

Members of the Committee:

Thank you for the opportunity to make this statement on behalf of Concerned Citizens for Nuclear Safety (CCNS). CCNS is a non- profit citizen action group based in Santa Fe, New Mexico and represents thousands of citizens. The primary focus of our group, as the name implies, is nuclear safety. As such, the WIPP project has been the subject of extensive study by our organization. I have only a very brief time to cover this vastly complicated subject. Over the past few years, people in New Mexico have taken the time to educate themselves about WIPP and are closely following this issue. Our citizens are well-informed and very aware that much of the so-called technical justification intended to prove WIPP will be safe are only ill-disguised politics masquerading as science. In 1980 public law proclaimed that WIPP would open to demonstrate the safe disposal of radioactive waste. In light of the growing multitude of hydrogeologic and operational problems which have surfaced at the site over the last ten years, it has become clear even for somebody who is not a nuclear physicist that WIPP cannot meet its congressional mandate.

If we peel our way through the layers of public relations and pseudo-scientific verbiage cloaking WIPP, we discover a constantly evolving understanding of the site. This new information belies the suitability of WIPP to safely isolate radioactivity from the environment. Our

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knowledge of the WIPP site has increased dramatically since its conception. We now know that the site is situated over a pressurized brine reservoir and beneath an aquifer, that this supposedly bone-dry site in fact displays a significant amount of brine seepage and the repository could be saturated within a few hundred years; that closure of the rooms is occurring at three times the expected rate; that gas generation is a significant problem; that fractures are developing at the excavation site; that the host rock is not capable of mitigating the pressurization problems as was once believed; and that there is new evidence that what are thought to be positive qualities of salt in a dry repository scenario are in fact major liabilities in a wet scenario.

Geologic burial was first proposed as a possible "solution" to the growing buildup of nuclear wastes at military production facilities across the country almost thirty years ago. Since that time no amount of scientific evidence to the contrary has been able to sway the Department of Energy from their pre- determined course of opening WIPP. We have effectively backed ourselves into a corner by relying solely upon WIPP to relieve our nuclear waste woes. But rather than do the logical thing and diversify our search for a possible solution, DOE doggedly persists in throwing good money after bad by trying to force a square peg into a round hole. Refusing to acknowledge the obvious, that WIPP is more of a problem than a solution, the latest plan of action for expediting WIPP's opening is the five year test phase.

Although at first glance "testing" the site seems like the responsible thing to do, the test plan raises more questions than answers. It calls for radioactive waste -- up to 2% of WIPP's final capacity -- to be tested underground at the site in either bin-scale or alcove-scale tests. The large-scale alcove tests call for radioactive waste barrels to be actually emplaced in the excavated rooms. However, it is curious that the vast majority of the proposed tests do not require the presence of radioactive waste at the site at all, such as the hydrological studies and seal tests. Those tests which do require actual radioactive waste -- such as gas generation -- would be much more efficiently performed in a controlled environment, such as a laboratory. In fact, the test plan itself states that only a lab test can provide the high gas pressures needed. In comparing the bin tests to the alcove tests, the test plan states "the bin-scale tests provide a technically more satisfying and rapid means of obtaining data." In a confined, controlled environment, no permanent damage is done should the tests fail.

The alcove tests, emplacing radioactive waste barrels into the repository, are proposed for the study of long-term waste compaction and gas generation rates. Since, in the interest of retrievability, no drums will be breached and the degree of closure upon the drums in five years will be minimal, these tests will in no way approximate waste room conditions over thousands of years. Hence, they will leave the question of WIPP's long- term containment ability unanswered. The test phase is supposed to prove WIPP safe -- but by definition it cannot.

Despite evidence that levels of gas generation -- a critical aspect of the repository's ability to contain radioactivity -- are largely affected by the mixture of wastes of varying compositions, such as those from different sites of generation, the test plan will only be utilizing waste from Rocky Flats and the Idaho National Engineering Laboratory. The composition of waste from INEL and Rocky Flats is not representative of the waste streams from other DOE facilities. Is it merely coincidence that waste for testing would be from the two very facilities whose waste back-log triggered the supposed nuclear waste crisis?

In sum, there is no real scientific justification for the emplacement of radioactive waste at WIPP for this five year test phase, an opinion shared by the General Accounting Office and independent scientists. There is considerable political pressure right now to pass a land withdrawal bill in order to start testing. Given the shaky foundation upon which this test plan is built, it seems merely a convenient strategy to get a foot in the door at WIPP, write the unknowns off for future study and research, and relieve the pressure at Rocky Flats and INEL.

Citizens and a few brave legislators have demanded that WIPP meet all EPA standards before any waste is emplaced -- even for a test phase. But DOE has insisted that the test phase is necessary to prove compliance with EPA standards [specifically the yet-to-be-promulgated 40 CFR 191 (b)]. Yet at a similar facility intended for commercial radioactive waste, Yucca Mountain in

Nevada, DOE is required to demonstrate compliance with the identical regulations before waste emplacement. It remains unclear why a test phase is necessary to demonstrate compliance at WIPP, but not at Yucca Mountain.

There is no contingency plan if tests should fail at WIPP. For lack of any alternative, the Final Supplement to the Environmental Impact Statement assumes the wastes would be returned to the point of origin -- a plan sure to meet with considerable resistance. In addition, test failure would in fact create even more radioactive waste than was emplaced to begin with.

There is considerable evidence that, in fact, WIPP will not be able to meet safety standards -- adding yet more fuel to DOE's fervent desire to open WIPP under the guise of "testing" and to gain further exemptions from federal environmental safety laws. In their report considering brine seepage at WIPP and the possible formation of radioactive slurry as suggested by the Scientists Review Panel, the Environmental Evaluation Group states "there is a clear possibility of the present design not meeting the EPA Standard 40 CFR 191, Part B. If the repromulgated standard is more stringent than the present one, it may be even more difficult to meet."

The EPA recently issued a preliminary decision to exempt WIPP's test phase from the waste treatment requirements of the Resource Conservation and Recovery Act in response to DOE's "no- migration" petition. The test plan is also geared toward demonstrating no-migration of hazardous materials over the long- term, in hope of obtaining a permanent variance from RCRA. Yet the latest version of WIPP's environmental impact statement concedes that radionuclides could reach the Culebra aquifer in only 400 years. It would logically follow that if radionuclides can migrate off-site, then the hazardous chemical constituents of the TRU waste could too. Therefore it seems highly unlikely that the DOE will in fact be able to demonstrate no-migration under RCRA.

Since WIPP is specifically exempted from NRC regulation, we are asked to rely upon DOE itself to certify compliance with these environmental laws. Self-certification must be based upon a solid foundation of trust. Quite frankly, the Department of Energy has failed to earn that trust. The DOE's legacy of environmental contamination and gross disregard for human health and safety at every one of their facilities requires an end to this self-regulation. The citizens of New Mexico demand independent scientific monitoring and certification of compliance with safety standards at the WIPP site.

If I had more time I could go into great detail on the inadequacies of the transportation program and the lack of emergency preparedness along the WIPP routes, the fact that massive defects were found in the TRUPACT-II shipping container following certification, and the distinct lack of long-promised bypasses around major population centers. Detailed information on WIPP transportation and the threat to New Mexico's economy posed by WIPP shipping and operations is provided in my written testimony.

In sum, it is time that we recognize WIPP is not a viable solution to the increasing volumes of nuclear waste in this country. If WIPP were to open, it would hold only 21% of the DOE's transuranic waste inventory in existence today. Nor is the waste slated for WIPP the waste that is currently wreaking havoc on the environment and human health. The waste to which we should be directing our primary attention is the waste which for years has been dumped into pits, ponds, trenches, stored in leaking underground tanks and even intentionally injected into deep wells. WIPP does not address the real nuclear waste problem.

It is important that we remember WIPP's status as a "pilot" project, setting the standard for nuclear waste disposal in the future. It is ironic and alarming that this trouble-ridden project is being utilized as the model of state-of-the-art technology for college students in waste management programs. This is somewhat akin to students of maritime engineering utilizing the Titanic as a prototype for an unsinkable ship.

Westinghouse has a team of 20 public relations people in Carlsbad; this alone triggers suspicion as to the scientific viability of the WIPP project. WIPP would sell itself without all this marketing if it were in fact a solution. You are dealing with an increasingly educated populace when it comes to nuclear waste. Extensive public relations efforts, exemptions from federal law and reams of paperwork will not stop the WIPP site from ultimately leaking, nor will it lessen the lethal health impacts of radiation. People know this.

You must recognize that people's fears are legitimate, that they have learned from the experiences of those living in the vicinity of Rocky Flats, Hanford, Savannah River, and other DOE embarassments. Those who made dire predictions about the effects of radiation were labeled "anti-nuclear extremists," but recent reports show that if anything, these so-called extremists may have underestimated the health risks associated with radiation. A recent National Research Council report states that "low-level" radiation is at least three to four times more dangerous than previously estimated. Of course nothing can be guaranteed 100% safe; the real question is whether it is really necessary to create the risk at all. This is not anti-nuclear hysteria; this is people taking responsibility for the future.

CCNS supports a policy of storage of nuclear waste at the site of generation in facilities specifically designed to isolate the waste from the environment in retrievable form while simultaneously researching alternative waste treatment, disposal and neutralization technologies. We must reject the out-of- sight, out-of mind mentality which has driven the WIPP project for so many years in the face of fatal technical difficulties. This is a time for re-evaluating our strategy; it is time we invested our resources into finding a safe, viable solution to the nuclear waste we have been thoughtlessly creating for so long, rather than selfishly foisting our problems onto future generations.

This concludes my statement; I will be happy to answer any questions you may have.

## Supporting Documents

**Testimony**
**of**
**Michele Merola**
**before the**
**Senate Energy and Natural Resources Committee**
**April 26, 1990**

1. Percentage of Existing DOE Transuranic Waste Inventory which would be transported to WIPP
2. "More Risk Seen in Low-Level Radiation," The Nation's Health, February 1990
3. "WIPP plan seriously lacking, GAO says," Albuquerque Tribune, January 12, 1990
4. "Defects found in WIPP waste shipment casks," Albuquerque Tribune, October 3, 1989
5. "WIPP Gas Causes New Concerns," Albuquerque Journal, September 19, 1989
6. "WIPP still far from reality," The New Mexican, March 18, 1990
7. "WIPP is bad for economy," The New Mexican, April 15, 1990
8. Testimony of Michele Merola before the New Mexico Environmental Improvement Board on WIPP transportation routes, April 9, 1990
9. New Mexico Businesses Against WIPP Economic Concerns

# Percentage of Existing DOE Transuranic Waste Inventory which would be transported to WIPP

Attached is page 14 from the *Integrated Data Base for 1989: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics, November 1989.* From Table 0.3 we see that the current DOE inventory of transuranic waste is 286,641 cubic meters. The breakdown of this total is as follows:

| Transuranic waste (DOE) | |
|---|---|
| Buried TRU waste | 190,837 $m^3$ |
| **Stored TRU waste** | **59,681 $m^3$** |
| Stored LLW* | 36,123 $m^3$ |

*TRU-contaminated waste in interim storage which -- it is assumed -- will be reclassified as low-level waste following non-destructive assay characterization

The stored TRU waste -- 59,681 cubic meters -- is the waste that is slated for deposition at WIPP.

**WIPP would hold only 21% of the existing transuranic waste inventory**

DOE/RW-0006, Rev. 5

# Integrated Data Base for 1989: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics

November 1989

Prepared by:

Oak Ridge National Laboratory
under Contract No.
DE-AC05-84OR21400

Prepared for:
**U.S. Department of Energy**
Assistant Secretary for
Nuclear Energy
Assistant Secretary for
Defense Programs
Office of Civilian Radioactive
Waste Management

Washington, D.C. 20585

Table 0.3. Spent fuel and radioactive waste inventories as of December 31, 1988

| Waste category | TRU isotopes (kg) | Mass (MTIHM) | Volume ($m^3$) | Activity[a] ($10^6$ Ci) | Thermal power ($10^3$ W) |
|---|---|---|---|---|---|
| Spent fuel (commercial) | | | | | |
| BWRs | | 6,756 | 3,215[b] | 5,179 | 18,900 |
| PWRs | | 10,850 | 4,751[b] | 13,476 | 51,600 |
| High-level waste | | | | | |
| Savannah River (DOE) | | | 128,400 | 661 | 1,830 |
| Idaho (DOE) | | | 11,000 | 67 | 196 |
| Hanford (DOE)[c] | | | 243,500 | 446 | 1,307 |
| West Valley (commercial) | | | 2,130 | 29 | 87 |
| Transuranic waste (DOE) | | | | | |
| Buried TRU waste | 771 | | 190,837 | 0.06 | 1.8 |
| Stored TRU waste | 2,055 | | 59,681 | 3.88 | 66.6 |
| Stored LLW[d] | 14 | | 36.123 | | e |
| Low-level waste (total area of all sites) | | | | | |
| DOE sites (262 ha)[f] | | | 2,471,600 | 13.42 | 18.61 |
| Commercial sites (74 ha) | | | 1,298,300 | 4.79 | 18.09 |
| Uranium mill tailings (commercial) | | | | | |
| Licensed mill sites[g] | | | 116,900,000 | e | e |
| Remedial action activities (DOE)[h] | | | | | |
| UMTRA Project (25 sites) | | | | | |
| Mill tailings and other waste (permanent storage) | | | 4,915,500 | e | e |
| FUSRAP (30 sites) | | | | | |
| LLW (permanent and interim storage) | | | 187,760 | e | e |
| Defense D&D Program (220 sites) | | | | | |
| TRU waste | | | i | e | e |
| LLW | | | i | e | e |
| Mill tailings | | | i | e | e |
| SFMP (civilian projects; 30 sites) | | | | | |
| TRU waste | | | i | e | e |
| LLW | | | i | e | e |
| Mill tailings | | | i | e | e |
| GJRAP (593 sites) | | | | | |
| Mill tailings | | | 52,070[j] | e | e |
| Reactor decommissioning | | | k | k | k |
| Mixed LLW | | | | | |
| DOE | | 70,208[l] | 52,140 | e | e |
| Commercial | | e | e | e | e |
| Miscellaneous, highly radioactive materials | | 252.5 | e | e | e |

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[a] Activity data are calculated values as of December 31, 1988.

[b] Includes volume of spacing between the fuel rods of each assembly.

[c] All tank waste has been declared HLW. However, this categorization could change after the work characterizing this waste has been completed.

[d] TRU-contaminated waste in interim storage which will be managed as LLW after retrieval and assay for certification.

[e] Information not available.

[f] ha = 1 hectare = 10,000 $m^2$ or 2.47 acres.

[g] Includes contributions from 26 licensed mills. At the end of 1988, only three mills were active.

[h] Unless otherwise indicated, inventories reported in this table for remedial action activities include only contributions from projects completed at the end of 1988.

[i] Should include only inventories of wastes stored at remedial action sites. This information is currently not available.

[j] Mill tailings stabilized by the Grand Junction Remedial Action Project through 1982.

[k] Most of this activity has involved small test reactors. (Exceptions are the Shippingport and Three Mile Island reactor facilities, whose inventories are reported in Chapter 7.) The LLW collected to date from such small reactors are included in the LLW inventories listed above.

[l] Mass of mixed LLW is expressed in metric tons (t) and include other elements in addition to heavy metals.

## More Risk Seen in Low-Level Radiation

Low levels of X-rays and gamma rays may lead to a risk of developing cancer that is three to four times what was previously estimated, a panel of the National Research Council recently stated.

In the fifth of a series of major reports on biological effects of ionizing radiation (the BEIR reports), a committee said the estimates of the hazards have been revised upward due to "significant developments our knowledge" on radiation exposure since 1980. The new data have been developed with the use of different risk models, revised dosage estimates for the survivors of the Hiroshima and Nagasaki bombs, and new epidemiological data on health effects in those who survived the bombs and persons exposed to radiation for medical purposes.

The committee estimated that if 100,000 persons were to receive a single dose of 10 rem (rad equivalent in man)

*See Low-Level...page 24.*

## Low-Level Radiation Seen As More Dangerous Than Previous Estimates

*...from page 6.*

there would be about 790 excess cancer deaths. If the same dosage were received over a period of weeks or months, the number of cases of excess cancer would be cut perhaps by a factor of two or more, the committee estimated. According to the panel current US occupational standards prohibit nuclear workers from receiving more than 5 rem of ionizing radiationof one year.

The also pointed to newly available data showing that Japanese women who survived the atomic bomb during their first six months of pregnancy produced children with less than average intelligence scores and school performance. The report, Health Effects of Exposure to Low Levels of Ionizing Radiation, is available from: National Academy Press, 2101 Constitution Ave., NW, Washington, DC 20418. 1-800-624-6242. (202)-334-3313.

APHA Annual Meeting
New York City,

September 30-October 4, 1990

"Forging the Future –
The Year 2000 Health Objectives."

# WIPP plan seriously lacking, GAO says

**By KAREN MacPHERSON**
Washington bureau

[illegible]

WASHINGTON — The Department of Energy hasn't justified its plan for radioactive waste experiments at the Waste Isolation Pilot Plant near Carlsbad, the General Accounting Office said.

The GAO, which is Congress' watchdog agency, said Thursday that DOE hasn't provided adequate technical justification for placing waste at WIPP before the facility meets federal environmental standards.

In fact, the GAO contended in its report that some of the experiments could be performed in a laboratory instead of at the $700 million Carlsbad facility — a recommendation sure to fuel the political battle over opening WIPP.

The GAO also recommended that all decisions on putting waste into WIPP should be made by Congress, not through an administrative procedure that DOE has begun as a fallback effort.

WIPP, built 2,150 feet under the desert surface, is intended to be the final resting place for plutonium-contaminated wastes from DOE weapons plants.

Rep. Mike Synar, D-Okla., who requested the GAO report, said it "seriously undermines DOE's contentions that waste must be placed into WIPP in order to demonstrate its suitability as a repository."

DOE's "failure to utilize viable alternatives leads one to suspect the Department is more concerned with loading waste into WIPP than the timely collection of data which is critical to determining the facility's suitability as a respository," added Synar, chairman of the House environment, energy and natural resources subcommittee in a press release today.

But WIPP's opening has been indefinitely delayed because of political and technical problems, including the battle over whether on-site experiments are necessary at WIPP.

DOE officials argue that the on-site experiments with 4,600 barrels of radioactive waste are necessary to determine whether the Carlsbad facility can meet the federal environmental standards.

But critics insist that no waste be placed at WIPP until it meets the federal environmental standards, which are designed to ensure that the waste is disposed of safely for up to 10,000 years.

The issue of whether to put waste in WIPP for experiments has divided the state's five-member congressional delegation and led to an indefinite postponement of work on the legislation that Congress must pass before WIPP is allowed to open.

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LOCAL/STATE

# Defects found in WIPP waste shipment casks

## Feds don't know if X-rays will prove flaws to be serious

By TONY DAVIS
Staff reporter

AT 10/3/89 A3

Federal authorities say they have found a tiny crack in one of the nuclear waste shipping containers for the Waste Isolation Pilot Plant and may have found a defect in another container.

Nuclear Regulatory Commission officials declined to speculate on the seriousness of the problems with either model of the TRUPACT II container.

But, assuming the problems are verified by outside inspectors,the commission doesn't want the containers to go on the road until it is certain the problems are repaired, said a commission spokeswoman.

The double-walled containers are supposed to shield cancer-causing radioactive wastes from the public when the wastes travel from weapons plants around the country to the WIPP site outside Carlsbad.

"It's a quarter-inch crack, and we haven't analyzed it," said Sue Gagner, a spokeswoman for the U.S. Nuclear Regulatory Commission.

"It (the container) doesn't meet the quality we are expecting. ... We don't want packages out there with these kinds of flaws, even if they're only a quarter-inch."

> "The films indicate some kind of discontinuity, but we don't know it it's acceptable or unacceptable."
>
> David Dawson
> Nuclear Packaging Inc. general manager

Design of the stainless steel containers won approval a month ago from the commission. But commission inspectors discovered the new problems last week, while inspecting production models fresh off the assembly line for use on the road.

Officials of the company that make the container, Nuclear Packaging Inc. of Federal Way, Wash., near Seattle, said they will not agree or disagree that either container has a crack until an outside expert can review X-rays of the containers this week.

"Radiography (the use of X-rays) is a very subjective kind of thing," said Howard Smith, a top Nuclear Packaging official. "Two people can look at the same piece of film, and some guy says it meets the code and the other guy says it doesn't."

The expert will represent X-Ray Inc., a private company from the Seattle area hired by Nuclear Packaging.

"The films indicate some kind of discontinuity, but we don't know if it's acceptable or unacceptable," said David Dawson, Nuclear Packaging's general manager.

Inspectors for the commission discovered the problems at Nuclear Packaging's assembly plant in Carlsbad. They found the problems in two of 400 X-rays of the containers they studied, said Gagner.

The inspectors don't know exactly what the second defect could be. But X-rays indicated that both problems were at points where melted metal is used to weld together two other pieces of metal at a joint.

The company had found and repaired the second defect, but inspectors weren't sure the repairs were properly done, said Gagner.

Both the welds help hold parts of the cylindrical-shaped container together. But they don't hold together the container at its crucial opening that separates the cask's top and bottom halves.

The commission had certified the containers after more than a year of tests and numerous problems with various test models that U.S. Department of Energy officials said were resolved.

Nuclear Packaging has produced three finished containers and nine partially finished containers on its Carlsbad assembly line for use on the highway.

The company has a contract with Westinghouse Corp. to produce up to 90 shipping casks for the WIPP project.

Westinghouse is DOE's prime contractor for WIPP, a pioneering repository that will bury nuclear wastes in salt beds 26 miles southeast of Carlsbad. The project's opening now is on indefinite hold.

# WIPP Gas Causes New Concerns 1

## Design Changes May Be Needed, Scientist Says

Alb. Journal 9/19/89

By Chuck McCutcheon

JOURNAL STAFF WRITER

Problems caused by gas generation at the Waste Isolation Pilot Plant may be significant enough to require changes in the nuclear waste repository's design, a scientific panel was told Monday.

The issue of gas generated by decaying radioactive waste buried at WIPP figures in the debate over when the repository should meet federal environmental standards.

Al Lappin, a Sandia National Laboratories scientist, told the National Academy of Sciences' WIPP review panel in Albuquerque that the level of gas generated is now thought to be 25 to 50 times greater than what is acceptable.

"Given the present waste form and our present understanding of the data, it looks like we will indeed have to do something to modify either the facility or the waste in order to reduce the gas generation," Lappin said in an interview.

Within recent years, scientists have agreed there is a chance gas could eventually build up to levels where it could fracture rocks at the underground storage dump southeast of Carlsbad, or make its way into an underground salt-water reservoir.

Although the gases themselves aren't radioactive, some scientists fear they could open up passageways for radioactive materials.

But just how realistic that scenario is remains unknown and must be studied, several of them said Monday.

U.S. Department of Energy officials told members of the academy panel they have

MORE: See GAS on PAGE A3

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# Gas Generation at WIPP Causes New Concerns 2

Alb. Journal 9/19/89

CONTINUED FROM PAGE A1

formed a task force to study whether any engineering changes need to be made to WIPP to solve the problems caused by the buildup of such gases as hydrogen, methane and carbon dioxide.

Among the issues the task force will explore is whether WIPP needs any alterations in its design, such as new vents that could handle gas, Sandia scientist Wendell Weart said.

Another area that will be studied will be whether a huge, expensive incinerator needs to be built to burn organic materials that contribute to generation, or whether chemicals need to be added to wastes to prevent gases from forming.

Sandia is overseeing all scientific experiments at WIPP under an agreement with the Energy Department.

"They'll be looking at a broad range of engineering modifications," Weart said of the task force.

The National Academy of Sciences panel recommended in July that "urgent attention" be given to the gas generation issue, which most scientists now consider to be a more pressing concern than brine seepage into the repository.

The academy is one of several groups that is independently studying WIPP. Energy Secretary James Watkins has said he will listen to the academy's comments in his decision on when the plant should open.

Gas generation resulting from decaying radioactive waste isn't unique to WIPP. Charles Fairhurst of the academy's WIPP panel said officials in the United Kingdom also are studying the issue.

There are three ways gases can be produced by the plutonium-contaminated wastes to be buried at WIPP's storage rooms 2,150 feet underground, Lappin said.

The most common is by corrosion of the 55-gallon metal drums holding the wastes. Gases also can result from bacteria occurring naturally in the decomposing wastes or from radioactivity that breaks down the toxic chemicals in the wastes.

In addition to forming the task force, Energy Department officials say the test plan for WIPP will help them identify the extent of the problem.

To conduct the tests, DOE plans to place about 600 55-gallon drums of waste in bins and about 3,800 drums in underground alcoves that are about one-fourth the size of the large rooms where WIPP waste eventually will be buried.

Those experiments, DOE officials said, will help tell them how much gas the waste will produce.

But a number of the Energy Department's critics contend that no waste should be sent to WIPP until the repository can first comply with U.S. Environmental Protection Agency standards.

Those standards would guarantee WIPP would not harm the environment for 10,000 years.

The deputy director of the New Mexico Environmental Evaluation Group, a full-time watchdog agency, said he remains unconvinced about the idea of conducting experiments in the alcoves.

Lokesh Chaturvedi also questioned whether the Energy Department would have results from the alcove experiments in time to show compliance with the EPA standards.

Located 26 miles east of Carlsbad, WIPP is designed to dispose of contaminated tools, clothing and other wastes from the nation's nuclear weapons plants. It was to have opened this month, but Watkins said in June it would remain closed for this year so a number of lingering technical concer could be addressed.

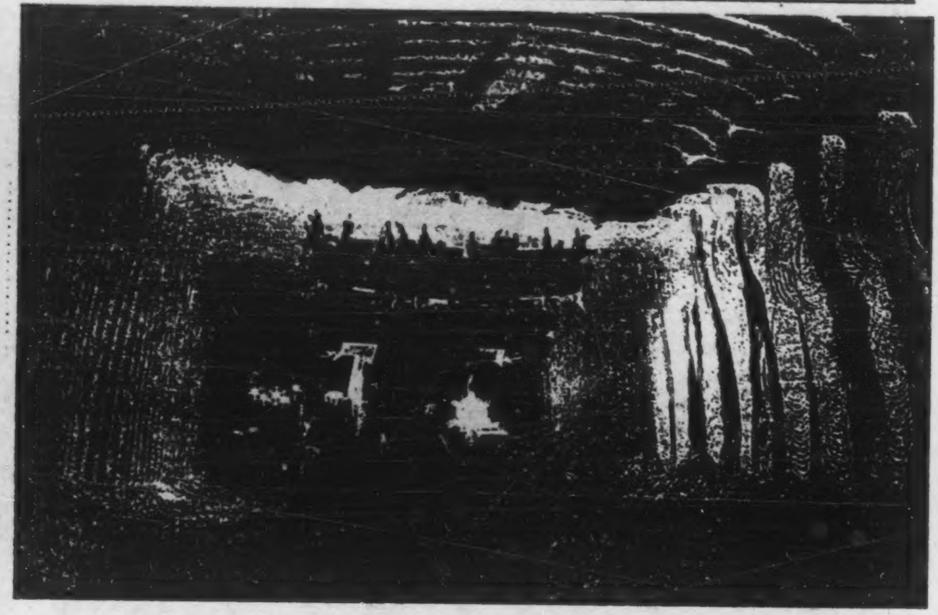

Photo courtesy U.S. Department of Energy

*Workers use a machine called a continuous miner to excavate rock salt during construction of the Waste Isolation Pilot Plant. The opening of the dump for radioactive and hazardous waste has been delayed at least a six times.*

# WIPP still far from reality

**By PETER EICHSTAEDT**
**The New Mexican Staff**

In the late 1970s, the city of Carlsbad made the Department of Energy an offer it couldn't refuse: Build a proposed storage plant for radioactive waste in the salt deposits of southeastern New Mexico.

For Carlsbad officials, the proposed project offered the promise of jobs and economic stability.

For Energy Department officials, the Carlsbad offer came after a Kansas community had rejected the project.

But more than 10 years — and at least a half-dozen delayed openings — later, the future of the Waste Isolation Pilot Plant is languishing in the New Mexico desert as public officials, environmental activists and people with no particular connection to the project raise questions about its safety.

When the project began, the question was: "When will WIPP open?"

Now it has become: "Will WIPP ever open?"

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On April 3 in Washington D.C., the U.S. Senate's Energy and Natural Resources Committee will hold a hearing on the status of the Waste Isolation Pilot Plant near Carlsbad.

WIPP in New Mexico

What the committee likely will hear from the Department of Energy about the nation's first permanent repository for radioactive waste, a $750 million project, is that everything is going well.

But statements by some federal officials and the lengthy list of problems that must be resolved at WIPP paint a different picture.

The Waste Isolation Pilot Plant site has been besieged by an endless set of problems that appear to be growing in magnitude, not diminishing, causing one after another of the projected opening dates to pass.

First scheduled to open in October 1988, the project now might not be ready to take waste until late this year or early next.

Energy Department officials have begun to speak cautiously about WIPP's future.

Late last month in Tucson, Ariz., at an international conference of more than 1,000 scientists who are experts on radioactive waste, a top-ranking Energy Department official talked of the need for alternatives to all department projects.

The Energy Department "needs contingency plans" for all its programs said Jill Lytle, of the department's waste operations agency.

"Now we realize we are in the middle of a (research and development) program at that plant," Lytle said of WIPP.

Last week, an Energy Department official told a House subcommittee that that department still is considering storage of radioactive waste at Los Alamos and seven other sites if WIPP is not open by the time Rocky Flats, a production plant in Colorado, runs out of room in 1991.

At the Tucson conference, Frank Parker, chairman of the National Academy of Sciences Board on Radioactive Waste Management, was equally cautious.

If the problems at WIPP cannot

See Problems on Page A-5

## WIPP question has changed

The question has been: "When will the Waste Isolation Pilot Plant open" for storage of radioactive waste?

But the question has become: "Will WIPP ever open?"

And, Department of Energy officials, who are responsible for the project, are among those asking questions.

*The New Mexican* has examined issues delaying the opening of WIPP.

**Today:** Will WIPP open, and what's delaying its opening?

**Monday:** The importance of WIPP in solving the nation's radioactive waste storage problem.

Santa Fe, N.M., Sunday, March 18, 1990 THE NEW MEXICAN A-5

# Problems at WIPP may be unsolvable

Continued from Page A1

be solved, then WIPP might never open, he said. And if WIPP does not open, then the United States might be forced to abandon plans to bury its radioactive waste in the earth.

"If we can't get WIPP open, we may never have geologic burial," Parker said.

WIPP is designed to be the final resting place for million of tons of tools, materials and chemicals that have been contaminated with varying amounts of plutonium during the construction of the nation's 22,000 nuclear bombs.

The waste has been largely stored in steel drums in 10 Energy Department laboratories and production plants across the country. Among those laboratories is Los Alamos National Laboratory.

The majority of the waste bound for WIPP would come from the Idaho National Engineering Laboratory, where the waste is sent from the Rocky Flats Plant near Denver where plutonium triggers are made.

Other radioactive waste would come from the Hanford Plant in the state of Washington and the Savannah River Plant in South Carolina, and seven other locations.

Energy Department officials argue that the waste is not safe where it now is and that it is contaminating these "temporary" storage sites.

Burying the nation's low and medium-level radioactive waste in salt, however, has turned out to be much more complex than anticipated in 1957 when the National Academy of Sciences recommended it in a brief 25-page report.

The report said that salt deposits had distinct advantages for burial of radioactive waste. Salt deposits were plentiful, easy to mine and "elastic," meaning they would quickly enclose the opened space.

The academy report also noted that the salt deposits took millions of years to form and should be stable long beyond the radioactive life of the waste.

But in recent years, the WIPP site has developed problems, some specifically related to the salt deposits that form the walls of the storage chambers.

Water has begun appearing on the salt-chamber walls dug 2,150 feet below the surface. And, the walls are closing faster than anticipated.

Studies concluded there was more moisture, called brine, in the salt than originally thought.

When the brine problem was first discovered, Energy Department officials officials downplayed its importance, saying the brine represented only about 1 percent of the volume of the walls.

More recently, some scientists have said the moisture might cause a more rapid decay of the waste that would be placed there.

The most serious problem to confront the WIPP project is not brine- but gas-related.

Massive volumes of gas would be generated as the various organic and chemical compounds in the radioactive waste begin to decay in their salt tombs. The gas is largely hydrogen and oxygen and would not be radioactive.

Scientists inside and outside of the Energy Department predict gas generation would be so great that large, high-pressure pockets would be created deep in the salt, causing cracks that would radiate in all directions.

Those cracks would threaten the huge salt water reservoirs that are about 800 feet below the waste chambers and might create pathways for radioactive waste to leak.

Such leaks would violate federal requirements that the waste remain buried for thousands of years until it is harmless.

The question of containment has forced the Energy Department to ask the Environmental Protection Agency for a waiver that would allow it to bury waste for experimental purposes.

The EPA is expected to issue a preliminary decision in April or May but will not issue a final decision until September or later.

Another variation on the containment theme that has been studied is the possibility of future accidental drilling into the site.

If the pressured gas pockets and the underlying brine reservoir were tapped, a geyser of radioactive waste could be sent skyward, scientists fear.

The gas problem has sent Energy Department scientists scurrying to their laboratories for solutions. A round of National Academy hearings earlier this month in Washington, D.C., discussed various proposals.

One proposal is to replace the steel drums in which the waste has been placed with plastic because the steel is estimated to be the source of about half of gas.

But replacing the steel with plastic could require repacking the estimated 286 million cubic meters of waste that has been accumulated in the past 45 years. This could be expensive, time-consuming and dangerous.

"It appears that some form of modification of the waste will be required," said Bob Neill, director of the Environmental Evaluation Group, an independent watchdog agency.

Incineration or burning the waste would reduce it to a radioactive ash. The ash then can be mixed with either cement, a process called grouting, or glass, a process called vitrification.

Those two processes would solve the gas problem by eliminating the organic material that would decay but would require moving the waste to an incinerator, which likely would need to be constructed on the WIPP site.

Constructing "an incinerator is a time-consuming, costly and difficult proposition," Neill said. "It may take years to design, build, test and approve an incineration system."

The state of New Mexico is currently developing regulations that would govern the incineration of radioactive materials, but the regulations will not be final until late this year or early next.

Meanwhile, the Energy Department is pushing for approval of a five-year underground testing program at WIPP, where as many as 5,000 barrels of waste would be placed to precisely determine how much gas is generated.

Four different scientific groups, including the Environmental Evaluation Group and the federal Environmental Protection Agency, have endorsed a restricted testing plan.

The EPA, for example, wants waste to be placed in the ground only after a plan is devised to remove it should the tests prove that WIPP will not work.

And the evaluation group has questioned the purpose of the tests and why they were not begun earlier in above-ground laboratories.

But no waste can be buried at WIPP until Congress passes a bill that removes the 10,000-acre site from public use. The bill is called the WIPP land-withdrawal legislation.

After one land-withdrawal bill died when Congress adjourned in 1988, another bill was introduced in 1989 by Rep. Joe Skeen, R-N.M., in whose district WIPP lies.

That bill went without a hearing last year and none is scheduled this year.

Both the Energy Department and other members of the New Mexico congressional delegation are expected to submit other bills that will address other aspects of the WIPP project, including spending $250 million for highway bypasses around major New Mexico cities, including Santa Fe, and road improvements to Carlsbad.

### Stories by Peter Eichstaedt

## Glossary of nuclear-waste terms

What the words mean:

- **Low-level waste:** normally has short-lived radioactivity of low intensity.
- **Mid- or intermediate-level waste:** has both long- and short-lived radioactivity of both low and intermediate intensity. Usually refers to waste from nuclear bomb production.
- **High-level waste:** long-lived radioactivity of very high intensity. Mostly spent fuel rods from nuclear power reactors.
- **Transuranic waste (TRU waste):** refers to the kind of radioactive elements of the contamination, specifically elements that are atomically "heavier" than uranium.
- **WIPP:** Waste Isolation Pilot Plant, a $750 million facility 25 miles east of Carlsbad where low and intermediate waste would be stored 2,150 feet deep in salt beds.
- **TRUPACT-II:** The second version of the official container for the transportation of transuranic wastes.
- **EEG:** The Environmental Evaluation Group, a federally-funded independent group of scientists from various disciplines hired to evaluate and critique WIPP.
- **Yucca Mountain:** the location in southern Nevada of the proposed permanent burial site for high-level waste. The project is being blocked by the state of Nevada.

WIPP In New Mexico

# WIPP is bad for economy

By RICHARD JOHNSON and DANIEL GIBSON

For years we have been told the Waste Isolation Pilot Plant would be a great economic shot in the arm for New Mexico. We were told it would create thousands of new jobs, increase our tax base, and create spin-off high-tech industries. That was the carrot dangled before us. The reality is that WIPP has actually done little to stimulate our state economy and in fact poses a great danger to its continued well-being.

Most of the financial rewards of the $790 million project have gone to the prime contractor, Westinghouse, and to out-of-state businesses.

WIPP is a capital intensive project. It requires investment in expensive machinery and equipment — most of which is not produced or sold in New Mexico. Some 650 mining jobs were created in Carlsbad, but those jobs are being terminated as the primary mining and construction activity winds down.

In fact, in the long run, WIPP may prove disastrous to Carlsbad's economy. Should there ever be an accident in or near Carlsbad involving the transportation of WIPP's radioactive waste, or radioactive leakage from the site, the primary mainstay of its economy — tourism — would be destroyed.

Nor is the danger to tourism just an issue for Carlsbad to consider. Partly as a result of public perception of New Mexico as a clean and unspoiled place, a "Land of Enchantment," tourism has become the state's second largest industry. In 1987, it accounted for nearly $2 billion in income. Using a conservative mulitplier of 2.5, the total impact of tourism in New Mexico today is approximately $5.6 billion annually.

In Santa Fe, where tourism-related business is the number one industry, using a multiplier of 3.5, the total impact is estimated at over $1 billion.

And this is a labor-intensive industry with a very high ratio of jobs to money invested. It is estimated that tourism results in direct and indirect employment of 22 percent of the state's populace. It also adds substantially to our tax base, through gross receipts taxes and income taxes.

All this is threatened by WIPP. Any accident involving shipment of radioactive wastes to WIPP will have a negative impact on tourism, even accidents that do not result in release of radioactivity. The New Mexico Environmental Evaluation Group (EEG) predicts at least five accidents in New Mexico involving WIPP-bound trucks during its 20-year projected lifespan. Other parties feel this is far too low an estimate in light of the 30,000 or so shipments that will converge on New Mexico from across the nation, and the nation's worst drunk-driving rates.

As we've seen in the recent past, environmental accidents can turn resorts into ghost towns. It was reported that Alaska expected to see a 40 percent decline in tourism following the Exxon Valdez oil spill. Atlantic coast communities experienced drastic declines in tourism after medical wastes began washing up on their shores in the summer of 1988. Other examples abound.

WIPP also poses an economic threat to land values. Along the proposed WIPP shipping routes, as in Santa Fe, realtors are beginning to ask home buyers to sign a disclosure statement indicating they are aware of the proposed route. Some realtors have had buyers decline purchases on these grounds. If WIPP trucks actually begin to roll, there will certainly be further psychological fallout and subsequent lowering of property values.

Should the worst happen and an accident occur with release of radioactivity, the economic costs would be staggering. The EEG, even while probably underestimating the amount of radioactivity that would escape in accidents, predicts a clean-up cost of $26 million for a severe accident in Santa Fe.

And this does not take into account the long-term impacts on property values, the tax base, tourism, loss of potential company relocations, etc.

Should the accident occur in a rural area, what would be the financial impact on agriculture, water resources, livestock or recreational resources?

When reviewing the economic plus/minus risks associated with WIPP, one must also take into account the possible costs of health care. A typical case of cancer costs between $100,000 and $150,000 to treat, not including lost productivity. These costs are carried by the taxpayer and increased insurance premiums.

While the Department of Energy downplays the possible health impacts of WIPP and its proposed shipping program, it is well-known that the chief radioactive element to be transported, plutonium, is perhaps the deadliest, long-lived toxin ever created. It can cause cancer, sterility, genetic deformities, birth defects and many other illnesses if inhaled or eaten in microscopic quantities. And it remains toxic for 240,000 years.

This is the true nature of the beast we are dealing with. If we are to make informed decisions about WIPP and its proposed shipping program, we must take a cold, hard look at the other side of the rosy economic picture painted by its proponents. WIPP could be a mistake we pay for over hundreds of thousands of years. We should all know, you don't get something for nothing.

*Richard Johnson is the owner of Cognito in Santa Fe and founder of Business Against WIPP. Daniel Gibson is media coordinator for Concerned Citizens for Nuclear Safety.*

## Testimony before the New Mexico Environmental Improvement Board 4/9/90 on WIPP Transportation Routes

My name is Michele Merola. I am the Director of Concerned Citizens for Nuclear Safety, a non-profit citizen action group which has been studying the WIPP issue for two years now. We are not scientists; we are a broad-based group of citizens who have educated ourselves on nuclear safety issues and in turn impart that knowledge to the public. Our main focus is to ensure that public health and safety are not compromised and that the proper legal avenues are pursued on projects such as WIPP. With recent polls indicating an increase in New Mexicans opposed to the opening of WIPP before federal environmental safety standards are satisfied, we hope to reflect the concerns of nearly half the people in this state.

Our research on WIPP has shown that this project is based on political expediency rather than good science, and that in the interest of such expediency, the health and safety of our citizens is indeed being compromised. This compromise extends to the issue of the transportation of nuclear waste from across the country into the state of New Mexico.

Today's hearing is intended to gather public input on the safest routes in the state of New Mexico for trucking hazardous and radioactive waste to WIPP. It is the goal of CCNS today to demonstrate that there is no safe route. In our opinion, the transportation of nuclear waste across 23 states -- almost 30,000 truckloads of it -- converging upon New Mexico is both dangerous and unnecessary. The danger is inherent in the system and the nature of the waste being transported. The Department of Energy has failed to demonstrate that their transportation program is safe, therefore no one route is any safer than another. We call upon the Environmental Improvement Board, as the guardian of the health and safety of New Mexico citizens and the quality of our environment, to reject all of the proposed routes.

CCNS feels that presently the only responsible action is to store the waste on site in properly designed facilities to isolate the waste from the environment and simultaneously pursue alternative waste treatment technologies. Trucking radioactive waste across the U.S. only increases the danger to the public by exposing greater numbers of people. This needless endangerment of the public is being proposed for the questionable objective of burying nuclear waste in a leaking $800 million hole-in-the-ground which is supposed to represent state of the art technology in nuclear waste disposal.

CCNS proposes that in light of the numerous, unresolved safety problems surrounding the WIPP transportation program these hearings are premature and that no routes should be approved until such time as there is adequate evidence that any transportation of nuclear waste is indeed necessary and would not needlessly endanger the public.

I will present for the record evidence that the DOE has yet to ensure public safety in the transportation of hazardous and radioactive waste. My testimony will address the risks of radiation from normal transport and from a possible accident resulting in the release of radioactive materials.

Now, as to the proposed transportation of nuclear waste through New Mexico to WIPP: if WIPP should open as planned, 28, 866 shipments of mixed hazardous and radioactive waste would converge upon the state of New Mexico from ten military production facilities across the U.S. This waste is contaminated with plutonium, a highly radioactive element which remains lethal for 240,000 years. At least 60% of this waste contains hazardous chemicals and solvents in addition to the radioactive materials. The main barrier between radiation and the public is the container in which this waste would be shipped, the TRUPACT-II. The TRUPACT was certified as a Type-B container for the transport of highly radioactive materials by the Nuclear Regulatory Commission in August of 1989. Our research has shown that NRC certification unfortunately does not lend much credibility to the integrity of these containers. Following certification, the NRC reported "massive defects" in the TRUPACTs [Albuquerque Tribune 11/10/89]. In one case, X-rays revealed 74 welding flaws. Several months later, inspectors found that the TRUPACT-II failed to meet the NRC's minimum standards for thickness. In some cases, areas near the weld joints had been ground down to only 1/10 of an inch thick [Albuquerque Journal 2/24/90].

On January 25, 1988, a certified Type-B container was involved in an accident which crushed the container and resulted in the loss of its radioactive contents [Albuquerque Journal, January 26, 1988]. This container had gone through the same series of tests that the TRUPACTs have passed to be certified. The accident stemmed from a careless driver who had failed to properly secure the container on the back of the truck; the container fell off the truck and was crushed beneath the wheels of a station wagon following behind. Although this container is small compared to the TRUPACT, this incident demonstrates quite clearly that NRC certification does not mean that a Type B container is necessarily capable of withstanding actual accident conditions. It also exemplifies the potential for human error in the transportation of these materials.

The United States General Accounting Office submitted a report to a Senate Committee in September of 1988 entitled "DOE Needs to Take Further Actions to Ensure Safe Transportation of Radioactive Materials" [GAO/RCED-88-195]. In reviewing Type-B containers that were already certified, the GAO found that in fact 28 of the 41 packages had potential safety-related concerns. For eight of the packages, reviewers found potential significant concerns, such as the container's ability to contain its radioactive contents, to prevent nuclear criticality, or provide adequate radiation shielding in the event of an accident. Furthermore, once the Department of Energy was informed of the potential dangers, the DOE continued to transport radioactive materials in some of these containers for up to six months. This does little to instill public confidence in either the NRC's certification program for Type-B containers -- such as the TRUPACT -- or the DOE's regard for public safety.

The GAO report went on to find that "package certification was driven by program schedule needs rather than the adequacy of the Safety Analysis Review Plan" [p. 25] and that "the pressure to sustain operations could crowd out the full consideration of safety-related concerns" [p. 28]. Both of these conclusions apply fully to the TRUPACT-II. The pressure on the DOE to solve the nation's nuclear waste dilemma has led them to rush the TRUPACT through an abbreviated and inadequate testing process. In fact, the DOE even concedes that "the hypothetical accident conditions used in testing the TRUPACT-II are based on engineering criteria and are not intended to duplicate actual expected accidents." [F-SEIS V3 p98] *emphasis added* This statement does little to assure the public as to the safety of these containers.

The standard NRC regulations for certification of a Type-B container -- which, as we have just seen, are basically insufficient anyway -- have not been changed since they were first conceived in the early '60s. One of the four tests required, the fire test, is conducted for 1/2 hour at 1475 degrees farenheit. Since the 1960's, there has been a significant increase in the number of highly volatile highway shipments, such as propane and butane. Propane, for example, burns at 4,000 degrees farenheit, far hotter than the temperature at which the TRUPACT has been tested. In fact, even the average temperature of a highway fire is 1850 degrees, more than the TRUPACT test conditions. The fire test for the TRUPACT does not demonstrate whether the container could withstand an accident involving a fire with a propane truck, or even an average temperature highway fire, for that matter.

Nor has the TRUPACT has not been tested under "crush" conditions, or simultaneous impact from two sides. Although the likelihood of such an impact in accident situations is quite high, the NRC does not require a crush test. It was a crush which resulted in the breach of a Type B container in 1988. The drop test of the TRUPACT was from a height of only 30 feet, although in actuality many bridges exceed that height. Testing did not include multiple drop or multiple contusion drops of three TRUPACTs mounted on a simulated or real truck bed, which would be the normal configuration for transport. Testing of the TRUPACT O-ring seals are only required once a year, and structural pressure tests are required only once every five years. Gas generation within the TRUPACTs poses a potential problem, as was again pointed out in a report released by Sandia Labs in January of this year [Al Lappin 1/90 Sandia National Laboratory]. The potential for human error is high every step of the way, in the manufacturing process, maintenance, and ongoing operations. Something as simple as forgetting to lubricate a critical seal before closing the container could be an invitation to disaster. The DOE has assumed that the handling of the TRUPACT will be flawless. Human error has been at the root of some of our worst catastrophes and cannot be discounted. We simply do not know enough about the behavior of the TRUPACT under realistic accident conditions to determine whether or not it is safe to transport radioactive waste in these containers at all.

Even under so-called routine or incident-free conditions, transportation of nuclear waste increases the exposure of the public to radiation. Contact-handled waste, defined as radioactive waste which measures no more than 200 millirems at the surface, will emit 10 millirems per hour of radiation from the TRUPACTs at a distance of 2 meters. This means that every nuclear waste shipment increases the amount of radiation to individuals living near WIPP routes or who happen to be standing or parked next to a WIPP truck during the course of routine transportation. More than 22,000 shipments of nuclear waste would be trucked through northern New Mexico -- that's about three trucks every day for the next 25 years.

The greatest concentration of nuclear waste shipments anywhere in the U.S. would be on highway 285 from El Dorado to highway 70 in Roswell; 5% of the total truck traffic on highway 285 would be nuclear waste shipments. People living in the El Dorado, Lamy, and Galisteo areas will be subjected to shipments of nuclear waste from Hanford, Idaho National Engineering Laboratory, Rocky Flats, and Los Alamos National Laboratory for an estimated "routine" exposure of 1,100 person-rems. People living in Vaughn, where waste from nine of the ten military facilities will converge, would be subjected to a routine dosage of 1,400 person-rems. [F-SEIS]

These projected "routine" exposures, which we suspect are unrealistically low, are of particular concern in light of the many prominent members of the scientific community who maintain that there is no safe level of radiation exposure.

respected experts in the field such as Jay Gould, Ernest Sternglass, Thomas Mancuso, Alice Stewart, and John Gofman. Dr. Gofman, an expert in radiology and one of the first doctors to work with plutonium, states "any exposure to radiation, however slight, can increase the probability of cancer and genetic effects" [Gofman, Radiation and Human Health, Sierra Club Books, 1981].

The most recent report by the National Research Council on the Biological Effects of Ionizing Radiation found that continuous exposure to low-level radiation could be essentially as damaging one tremendous, high-power blast such as was experienced at Hiroshima [BEIR-V]. The study concluded that what are currently considered "acceptable" levels of radiation are in fact too high by a magnitude of three or four times, and that radiation exposure increases the risk of mental retardation among fetuses and puts the general population at a much greater risk of contracting fatal cancers.

A study released just two months ago in February of 1990 revealed that routine radiation exposure experienced by male workers at a nuclear power plant in Great Britain is directly linked to the excessive rate of leukemia and lymphoma in the children of these workers [Results of case-control study of leukaemia and lymphoma among young people near Sellafield nuclear power plant in West Cambria, Martin J. Gardner, et al., British Medical Journal, 2/17/90, V300, pp 423 - 429]. With time and expanded research, the devastating effects of radiation on the human body are becoming increasingly evident in the form of cancers and genetic mutations, and it is also becoming increasingly clear that there is, in fact, no threshold below which radiation is not harmful.

The danger of routine radiation exposure is greatest for those living or working on a WIPP route. For example, the estimated maximum dosage to a person working at a truckstop on the WIPP route was calculated to be a total of 1,460 millirems [F-SEIS V2 pD-62]. That's the equivalent of 146 chest x-rays, but without the benefit of protective shielding. Such "routine" exposure of people to radiation from the transportation of nuclear waste is entirely unacceptable.

No risks were evaluated for the shipment of waste from Los Alamos National Laboratory through Santa Fe on St. Francis Drive, the preferred route proposed here today, because it was assumed that the bypass will be used. Construction has hardly even begun on this bypass. What guarantee do we have that it will be done before shipments begin? And what about the bypasses around the other major population centers that were promised -- around Roswell, Hobbs, Artesia and Carlsbad? Construction hasn't even begun, and the future of funding for these improvements is dim at best.

The estimated radiation exposures from WIPP transportation are based on the assumption that if waste is allowed to be buried at WIPP for a five year test phase, that WIPP will eventually meet EPA standards for the disposal of radioactive materials under the newly-promulgated 40 CFR 191 (b). If WIPP should fail to meet EPA standards, waste would have to be removed from the site and trucked out again, thereby doubling the risk to the public and the exposure to radiation, but this risk to the public has not been evaluated.

Of even greater concern is the transportation of remote-handled, or so-called RH-TRU waste. RH-TRU waste has a surface rate of radioactivity greater than 200 millirems, requires lead shielding and must be handled by robotic means. The DOE has only just come up with the design for the container which would be used to transport these highly radioactive wastes; the container has yet to be tested or certified. RH-TRU wastes emit beta and gamma radiation, high-energy, penetrating forms of radiation, in addition to the alpha radiation which is emitted by plutonium. The paper suits issued as part of the WIPP emergency response kits would be useless in the case of an accident involving the release of RH-TRU waste.

More than 25% of the waste which would be shipped to WIPP will be this high-level, RH-TRU waste. 38% of the high-level radioactive waste scheduled to go to WIPP would pass through northern New Mexico. The DOE has somehow calculated both the routine and accidental exposures to radiation from the shipment of this remote-handled waste, despite the fact that they don't even have a shipping container yet. How can the public adequately assess the magnitude of the danger from nuclear waste transportation when a significant portion of the critical information has yet to be formulated? Again, I would like to reiterate that until issues such as the transportation of remote-handled waste and other unresolved problems are adequately addressed, it is both premature and inappropriate to designate any transportation routes whatsoever.

Furthermore, it is impossible for the public to make meaningful comments on the ramifications of nuclear waste transportation when they are presented with erroneous and illogical information. The predicted frequency of accidents is based on NRC statistics that are thirteen years old [F-SEIS V2 pD-66]. According to the Final Supplement to the Environmental Impact Statement for WIPP, radiation exposure to the public will be greater under routine conditions than under accident conditions [F-SEIS Executive Summary S-19]. This makes no sense. It is also curious to note that the DOE predicts almost 5 times as many deaths from an accident involving the lower-level, contact-handled waste than from the high-level RH-TRU waste. The DOE predicts a maximum of 50 cancer deaths from an accident involving contact-handled waste, and 11 cancer deaths from an accident with a release of remote-handled waste. Given the historical tendency of the DOE to underestimate the magnitude of contamination associated with their activities and its ill effects on the populace, this already substantial predicted risk is clearly unacceptable.

Nor is the public presented with realistic accident scenarios with which to assess the possible impacts of nuclear waste transportation. Between the years 1971 and 1985, there were 1,034 accidents or incidents involving "low-level" waste; radioactive materials were released in 90 of those cases ["Radioactive Materials, A Performance Assessment Summary," ASME Radwaste Systems Committee, American Society of Mechanical Engineers, New York City, 1986]. The DOE predicts that there will be 104 accidents during the operation of WIPP [F-SEIS V2 pD-134 Table D.4.14]. Yet the likelihood of an accident with a release of radioactivity is estimated to be less than one in 100,000, the breach of a TRUPACT is summarily dismissed as "not credible," and the worst case is assumed to be the release of .02% of the radioactivity.

Since a breach of the container is considered "not credible," it is further assumed that there will not be enough oxygen inside the TRUPACT to sustain a fire and the very real possibility of a fire and its effects on a breached container are not analyzed. The impact of fire is especially great since volatilization is required to transform much of the radioactive waste into respirable form. Of special concern involved with the possibility of a fire is the fact that sealed containers of liquid of one gallon or less are allowed inside the waste barrels. Many of these liquids are highly explosive chemicals, which could greatly exacerbate the effects of an accident and extend the spread of radioactive contamination. But this possibility is never addressed.

Gross assumptions made in evaluating the effects of a nuclear spill contribute to the underestimation of the devastating consequences of radioactive contamination. For example, in predicting the exposure resulting from the worst case scenario, the DOE assumes that the accident occurs in an urban or suburban area, and that therefore "ingestion impacts associated with contamination of agricultural products were not applicable" [F-SEIS V2 pD-92]. Unfortunately this scenario does not apply to most of New Mexico, which as we all know is mostly rural and depends heavily upon agricultural products.

Plutonium is the primary radioactive material in the waste that would go to WIPP. Plutonium is an alpha-emitter, which means that externally it is not very harmful -- it can be repelled by paper -- but it is deadly in microscopic quantities if ingested or inhaled.

Bearing this in mind, let's look at another assumption the DOE makes when calculating the possible effects of radiation exposure from a transportation accident. In analyzing the effecus of an accident resulting in a release of dispersible radioactive materials, the DOE states that "exposure by ingestion is not included in evaluating the radiological impacts of accidents because it is assumed that emergency response and governmental authorities would intervene to impound foodstuffs, provide an alternative water supply, and clean up contaminated land" [F-SEIS V2 pD-83]. This ridiculous and totally unrealistic assumption renders the estimated radiation exposures due to accident conditions completely invalid. Does the state of New Mexico have a plan in place for impounding food, providing clean water and somehow cleaning up land in the event of widespread radioactive contamination? New Mexico's Environmental Evaluation Group has stated that an assessment of possible radiation dose by ingestion is necessary "to estimate the amount of low-level, long-term dose that may be unavoidable if such a release occurs" [EEG5 October 1980]. We don't know how to "clean up" the environment once it has become contaminated with radioactivity. If we did, we wouldn't be in this mess in the first place.

Admittedly, the probability of a radiation release from a TRUPACT accident is relatively low. The containers are built to withstand severe accidents and they most likely will not breach except under catastrophic conditions or in the event of serious human error.

However, think of the Valdez oil spill. Only one accident in 9,000 tanker trips over 12 years sounds like a pretty good safety record. But how meaningful is that statistic in the context of what that one accident was? Based upon computer models, the chance of an accident at Chernobyl was predicted to be one in ten million reactor hours; the accident occurred after only 300 reactor hours. Although the chance of a WIPP transportation accident may be exceedingly small, how significant will that low estimate be should that one, devastating accident occur?

In the event of an accident, the DOE is relying upon a satellite tracking system for notification rather than escort cars for the WIPP trucks. This satellite system will emit a signal every 15 minutes which will be relayed to a central communications center to ensure that the vehicle is moving and on the assigned route. In the event of a failure in the satellite system, the truck drivers are supposed to call in to the communications center every 2 hours. In the event of a satellite communications failure, then, an accident could occur and it could conceivably be up to two hours without communication before the DOE center would realize that something was wrong. This is an important point, since local authorities must rely upon the DOE for notification of the accident and it is the communications center which has the information on the nature of the materials carried in that particular shipment and which would be involved in the accident. It is also rather troublesome, given the DOE's history of reluctance in admitting to accidents, to rely upon the DOE for notification in case of trouble. It took an FBI raid at Rocky Flats to expose the history of DOE malpractice and contamination there; why should the WIPP transportation program be any different? How can we trust the DOE to notify us in case of a release of radioactivity from their trucks?

If an accident should occur, it is the State, local or tribal authorities who have responsibility for responding, not the DOE. The DOE is responsible for providing assistance when requested. According to federal laws, each State, Tribal and local government is responsible for developing their own emergency response plans and for providing the first response to emergencies involving radioactive material. CCNS requests that the EIB conduct a survey of all affected entities of State, local and tribal governments affected by WIPP transportation to determine if they are capable of responding to an emergency involving the release of radioactive materials and whether they have formulated appropriate emergency response plans. Authorization of the WIPP shipping program should not be granted by the EIB until this survey has been completed and remedial action, if necessary, undertaken.

The DOE has provided some training for first-responders along the WIPP routes. Unfortunately, in New Mexico more than 70% of the people who would be first-responders are volunteers and are not required to receive training. In most cases training consisted of an 8 hour seminar. Although some emergency personnel felt the course was adequate, others have described the course as "a joke -- it was a PR job for Westinghouse. All they told us was it's safe, you won't have any problems." CCNS questions whether a one day classroom course is sufficient for the dangerous job these first responders are being asked to perform.

The chief of one of the volunteer fire departments in Santa Fe County told CCNS that out of 300 volunteers, perhaps 6 had been to a WIPP training session. He noted that there is only so much time and motivation amongst volunteers to take advanced training courses. He also pointed out that the paper suits provided in the emergency response kits would not fit over the air packs first responders would have to wear in the event of an accident. He described the kits as marginal. WIPP emergency response kits consist of two paper suites, several pairs of rubber gloves, two respirators, duct tape, and a plastic sheet. First responders do not have radiation equipment capable of detecting alpha radiation such as that emitted by plutonium, nor are they being trained to use such equipment. Geiger counters will not pick up alpha radiation. First responders arriving at the scene of a plutonium spill will have no way of knowing the extent of the radiation release. The paper suits would be a futile attempt at protection if the accident involves RH-TRU waste which emits beta and gamma radiation. CCNS asks if responders are being sacrificed because the DOE hopes to save money by not providing alpha radiation monitors and other essential equipment?

In testimony on WIPP before a house oversight subcommittee hearing submitted by the U.S. General Accounting Office on June 12, 1989, the GAO reported that most emergency response offices surveyed did not feel prepared. An informal phone poll conducted by CCNS to sheriff departments, fire departments, police departments and other first responders located along the WIPP routes confirmed the GAO findings and revealed that many of the first responders felt their level of training, knowledge and equipment to deal with a WIPP truck accident was inadequate.

The DOE does maintain an active Radiological Assistance Program. This team is only available, however, after the state or local authorities have worked through a maze of nine bureaucratic steps in requesting their assistance, requiring several phone calls back and forth to Washington, D.C., to determine the actual extent of the emergency [F-SEIS V2 pC-11]. Obviously it would take some time before this special assistance team would arrive on the scene of an accident. The availability of this team is also contingent upon "the extent that resources permit" [F-SEIS V2 pC-9]. Their help is by no means guaranteed.

There is a general lack of training, equipment, and qualified on-site radiological experts in hospitals along the routes. The DOE has provided radiological monitoring instruments, assorted decontamination supplies and training to only two hospitals, one in Hobbs and one in Carlsbad. As for the rest, the DOE claims it is their own responsibility to be prepared as a requirement for accreditation under the terms of the Joint Commission on the Accreditation of Healthcare Organizations. Again, the EIB should be responsible for determining whether the hospitals along the proposed WIPP routes in New Mexico are in fact prepared for a radiological emergency.

Chelating agents and other drugs have not been distributed to the affected communities for response to an accident involving radiation exposure. For example, DTPA, a chelator drug used for radiation victims, is most effective if administered within one hour of contamination. Yet this drug can only be dispensed by 42 specially licensed physicians throughout the U.S. How likely is it that an irradiated victim in a remote area of New Mexico would have access to this drug within one hour?

In addition to emergency response, State, local or tribal authorities are also responsible for formulating evacuation plans for their communities. In most areas, evacuation plans consist of antiquated or non-existent civil defense plans. We find it very alarming that the DOE disavows any need for evacuation, recommending, at most in the event of a radioactive spill, that an area with a radius of 150 feet from the source be cordoned off and people excluded from this area until cleanup is completed. I certainly hope that the state of New Mexico is prepared to do more than this to protect its citizens from the hazards of radioactivity. CCNS requests that the EIB include evacuation capabilities in their survey of preparedness along the proposed routes, and that remedial actions be taken if necessary.

The Department of Energy maintains that "in the unlikely event that a release of radioactive material has occurred, the DOE or its contractors will . . . decontaminate soil, vehicles and persons as needed . . . and return the site of the accident to normal use" [F-SEIS V2 pC-18].

Decontamination of an object, a person, or the environment is impossible once contaminated by radioactivity. If decontamination were possible the Department of Energy wouldn't be trying to bury all of their radioactive waste at WIPP. The possible consequences of trucking nuclear waste across the states must not be underestimated. Just one accident involving a radioactive spill could have far-reaching and long-lived effects on our environment, our economy, our health, our future, and our children.

If public health and safety is of any concern at all to the Environmental Improvement Board, then the WIPP transportation program in its entirety must be rejected. The integrity of the TRUPACT is questionable, we have no technical criteria by which to assess the transportation of high-level remote handled waste, emergency response plans are inadequate, and the health risks to the public from sustained exposure to low-level radiation is unacceptable, as are the number of predicted cancer fatalities in case of an accident. CCNS maintains that the transportation of nuclear waste under current conditions is both unwarranted and unnecessarily hazardous. There are simply too many outstanding problems to believe that the WIPP transportation program could be safe on any route.

# NEW MEXICO BUSINESSES AGAINST WIPP
# ECONOMIC CONCERNS

PRESENTED TO:
THE UNITED STATES CONGRESS

APRIL 26, 1990

## NEW MEXICO BUSINESSES AGAINST WIPP
## ECONOMIC CONCERNS

A 400 member coalition of Santa Fe area businesses called Business Against WIPP (BAW) was established. The information which follows is the collective effort of many concerned residents in the Santa Fe area. These residents are afraid for their health and safety, and the economic welfare of New Mexico. Although the geographic focus of this statement is Santa Fe, NM, the scope of the risks associated with transportation of tru-waste to the WIPP spans twenty-three states. Many of us have made economic sacrifices to be living in New Mexico's "Land of Enchantment"; we are not ready to encounter additional economic risks for the sake of a dangerous and foolhardy government experiment. If WIPP were ever to open, every locale along the WIPP route will be facing some version of what we're describing here for Santa Fe. (Appendix A: WIPP Transportation Map).

Today if you were to purchase a house from a member of the Santa Fe Board of Realtors one of the papers you might be signing is a disclosure statement indicating that you are aware that the property you are about to buy is on the proposed WIPP route. When this is done it is to protect the legal position of the realtor.

If WIPP were to open and proposed routes were to become the actual routes what then would happen to the real estate market? Even without any publicized accidents the mere sight of truck loads of radioactive waste driving past a property will deter some buyers from purchasing on a Wipp route. Other segments of the market may be deterred by disclosure statements or a general climate of public distrust.

Even the Department of Energy's predicts that there will be accidents along the WIPP route. Using outdated 1977 transportation figures DOE predicts twelve accidents in twenty-five years. This figure does not take into account that speed limits have increased, there are many more vehicles on the road, and there is more substance abuse. Naturally, independent estimates for accidents are much higher than DOE predicts. The likelihood that an accident will occur in New Mexico is compounded by the fact trucks coming from DOE waste producing sites around the nation will be converging here and by the fact that we lead the nation in many statistics on drunk driving.

According to The 1987 Annual Report of New Mexico Health Statistics by New Mexico Health and Environment Department (HED) NM's traffic accident mortality rate is twice the national average and ranks number one in the nation. The figures for alcohol related deaths are three times the national average. In deaths per vehicle mile New Mexico is ranked number one. Clearly, when accidents begin happening along the WIPP route people's anxiety will increase and the negative impact on property will increase correspondingly. An accident which might not involve any radioactive release could still create a climate of fear that would adversely affect values. DOE's projections have never included the consequences of an accident that did not involve a spill.

If a serious accident involving a radioactive release were to happen in New Mexico it is not unreasonable to assume that property values in Santa Fe may decline an average of five per cent. Currently the total assessed property value in Santa Fe is a little more than $4 billion . A five per cent decline in property values would mean a loss to Santa Fe County of some $200 million. The resulting decline in bank portfolios would hinder other economic development projects.

The enormity of our nation's nuclear waste crisis is only just beginning to come to light. As the public becomes more aware of the nuclear waste crisis, the predicted 30,000 truckloads of deadly radioactive wastes being transported on the highways of our New Mexico is bound to affect the image and reputation of our state.

As a result of the public's perception of New Mexico as a relatively clean and unspoiled place, tourism has grown from $1.5 billion annually in 1983 to a nearly $2 billion industry in 1987. (Appendix B: Bar Graph #1) The growth rates for that period varied annually from 3.2% to 11.2%. (Appendix B: Bar Graph #2) Assuming no real growth since 1987 direct tourist spending in New Mexico will be approximately $2.2 billion. This figure brings 1987 to 1990 dollars. (Appendix B: Bar Graph #3) Using a very conservative multiplier of 2.5, the total impact of tourism on the New Mexico economy is approximately $5.6 billion annually. (Appendix B: Bar Graph #3) However, looking more closely at specific arts-related industries in our state, shows the New Mexico Film Commission using a multiplier of 3.0 and arts organizations in general using a multiplier of 4.0. In Santa Fe where the concentration of tourists and tourist- and arts-related businesses is much higher than the state average, an accurate multiplier would probably be even higher than 4.0. However, not to overstate the argument let's establish a conservative multiplier of 3.5 for Santa Fe County. Assuming no growth in tourism since 1987 and bringing 1987 figures to 1990 dollars direct tourist spending in Santa Fe represents a $298 million industry. Using our conservative 3.5 multiplier, then, the total annual impact of tourism on the Santa Fe economy is slightly over $1 billion. Tourism is the number one source of revenue in Santa Fe and the number two source of revenue statewide.

The New Mexico Department of Taxation and Revenue estimates that 25% of Gross Receipts Taxes collected in the state are paid by non-residents. Approximately $165 million in state taxes are collected annually from this primarily tourist group. These revenues, which account for nearly 10% of all state revenues, are used to fund education and general government in New Mexico. Additionally, local taxes such as the lodgers tax and supplemental gross receipts taxes are paid by tourists and fund local government operations and services.

Keeping in mind the economic importance of tourism, as it relates to jobs in New Mexico:

> In 1987 tourism directly resulted in the employment of 46,000 New Mexico workers and the number of workers thus employed has grown steadily since 1983. (Appendix B: Bar Graph #4) The tourist industry directly employs nearly one in ten New Mexico workers. (Appendix B; Pie Chart #5)

**When compared to other sectors of the New Mexico economy, in terms of employment, tourism is larger than manufacturing, construction, transportation, communications, utilities (TCU), finance, insurance, and real estate (FIRE).**

Within the state of New Mexico WIPP was purportedly going to generate substantial revenues and create employment. However, almost all of the economic benefits have been enjoyed by the project's prime contractor, Westinghouse. Little of the $750 million invested so far has trickled down to the local level. Some temporary construction and mining jobs were created in Carlsbad, helping that town's severely depressed economy, but these positions are naturally being terminated as the building phase ends.

The WIPP operations are capital intensive, resulting in a very low ratio of jobs per dollar spent. The tourism industry is just the opposite. It is labor intensive with one of the highest ratios of jobs per dollar invested. At WIPP most of the employment will be skilled workers from outside the region. The tourism industry is just the opposite with a great multiplier effect in the local economy and employing mostly local residents who need no complicated technical training to perform their jobs. Tourism results in the indirect employment base for 22% of all jobs in New Mexico. (Appendix B: Pie Chart #7)

A large percentage of the workers in the tourism industry would be some of the least employable in other areas of the work force. Therefore large scale layoffs in the tourist industry would put a severe strain on social services and result in unacceptable levels of unemployment. As you can see tourism is an extremely important and growing sector for New Mexico and its local economies. The Santa Fe business community is extremely concerned about WIPP. Currently there are over 400 Santa Fe businesses who have taken a public stand as a Business Against WIPP. We're concerned that our businesses, our families, our community and our state will suffer by allowing the transportation and disposal of nuclear waste within our borders. Tourism represents our economic life blood. One accident involving a WIPP truck resulting in the release of radioactivity could be a death blow to tourism. Attraction to New Mexico is based upon the public perception of it as a clean and unspoiled place, "The Land of Enchantment". In the event of a nuclear accident, what is the half life of that perception? When our culture finally develops energy and even weapons technologies that don't leave this kind of toxic legacy behind, will we be kicking ourselves for being victimized by this obsolete, lethal dead end technology.

In recent history the Texas beach communities along the Gulf of Mexico experienced a decline in tourism as a direct result of the oil spill in 1981. Long Island and New Jersey also experienced substantial declines in tourism as a result of medical wastes washing up on their beaches. The US Travel Data Center has reported a 33% decline in tourism from the summer of 1987 compared to the summer of 1988. Accidents have the proclivity of turning resorts into ghost towns. The press reported that Alaska experienced a 40% decline in tourism last summer as a result of the Exxon/Valdez oil spill. If, as a result of a WIPP-related radiation accident four out of ten would-be tourists suddenly do not take vacations in New Mexico what would be the impact on our state and local economies? Given our established economic dependence on tourism it is safe to say that our economies would be devastated. Our state economy would experience a $874 million loss in direct tourist spending and a multiplicative $2.2 billion loss in total economic activity. In Santa Fe those figures translate to a $119 million loss in direct spending and a $400 million loss in total economic activity. Unemployment will go up, adding tremendous burdens to our social service agencies. At the same time tax revenues will plummet; income tax and gross receipts taxes will be drastically reduced necessitating in decreases in every kind of service provided by state and local governments. Picture New Mexicans coping with decreases in health care, education, highway maintenance, lending and support services for agriculture and economic development, regulatory enforcement ....and the list goes on. Under the terms of the Price-Anderson Act none of these losses could be recovered by our state, our municipalities, or any individuals.

A serious WIPP related accident resulting in a radioactive release within New Mexico or any of the twenty-three states on the WIPP routes would be covered on the evening news by each of the three major networks and CNN as well as every daily newspaper and news magazine in the world. It would be impossible to accurately estimate the negative dollar impact of this alarming news; but the figure is likely to be in the hundreds of millions. Currently the state of New Mexico spends approximately $1.5 million annually to promote tourism. What will New Mexico or any other state have to spend to counter the effects of this much negative publicity...if in fact that would be possible...; and where will the money come from?

In recent years New Mexico has been actively soliciting businesses from outside the state to relocate in our state. If WIPP were to open and some 30,000 truckloads of radioactive waste would begin rumbling across the highways of our state certain of these businesses would be deterred from relocating here. One of our economic development success stories has been the New Mexico Film Commission. Major movie production in the state is currently a $10,097,000 industry annually with a multiplicative of 3 the annual impact of $30,291,000. There is a growing belief that the opening of WIPP and the ensuing transportation risks could present a serious setback to New Mexico's hopes of attracting substantial income from movie production activities, thereby losing a clean and labor-intensive industry which brings positive publicity as well as money to our state. I would like to submit for the record letters from two film producers who have worked in New Mexico. (Appendix C: Moctesuma Esparza Letter and Robert Katz Letter)

Numerous agreements with New Mexico require the DOE to fund the construction of bypasses around communities on designated WIPP routes and to widen, improve or harden all WIPP-designated transportation routes that are not interstate highways. However, as recently as March 29th of this year Energy Secretary James Watkins told the House Armed Services Committee that he strongly opposes any additional money for WIPP-related road improvements in New Mexico and that New Mexico should not expect any additional road funds. Bypasses are needed and have been promised for Santa Fe, Los Alamos, Roswell, Hobbs, Artesia, and Carlsbad. So far the federal government has only appropriated $43 million of the $200 million promised for the needed bypasses and road improvements. Now it appears the federal government is reneging on its promise to give New Mexico an additional $157 million. Where is that money to come from if not the federal government? Is the economic burden to finish this bypass to be placed upon the state of New Mexico? That's $157 million dollars that we don't have. Even if the federal government does make good its promise to provide New Mexico with $200 million, it will only be enough to complete the Santa Fe bypass, provided there are not the usual cost over-runs. What about the bypasses that are needed and have been promised for other communities along the WIPP-route? What about the other promised road improvements? Why should New Mexico have to shoulder this economic burden in addition to all the economic risks this experimental program entails? Since Secretary Watkins is a relative newcomer to the WIPP controversy, it is understandable, though regrettable, that he is unaware of certain commitments the DOE has made to New Mexicans.

It is reported in The Transportation of Nuclear Materials Sandia Report, Dec. 1984. that in the case of Price-Anderson as it applies to DOE contractor activities, the federal government's maximum liability for any one incident in the United States is $500 million. The DOE admits that the public will be exposed to low levels of radiation through the TRU-PAC II container used to transport radioactive waste to the WIPP site. However, there is no accounting in the Price-Anderson Act for the long term health care, death, and disease associated with plutonium contamination. Chronic fatigue syndrome, hormonal disorders, sterility, birth defects, cancer and multiple other health problems are associated with long term / low exposure to radiation. A typical cancer case costs between $100,000 and $150,000. One hundred such cases would cost at least $10 million to treat. The potential costs of these health effects on families, individuals, and the work force are impossible to predict.

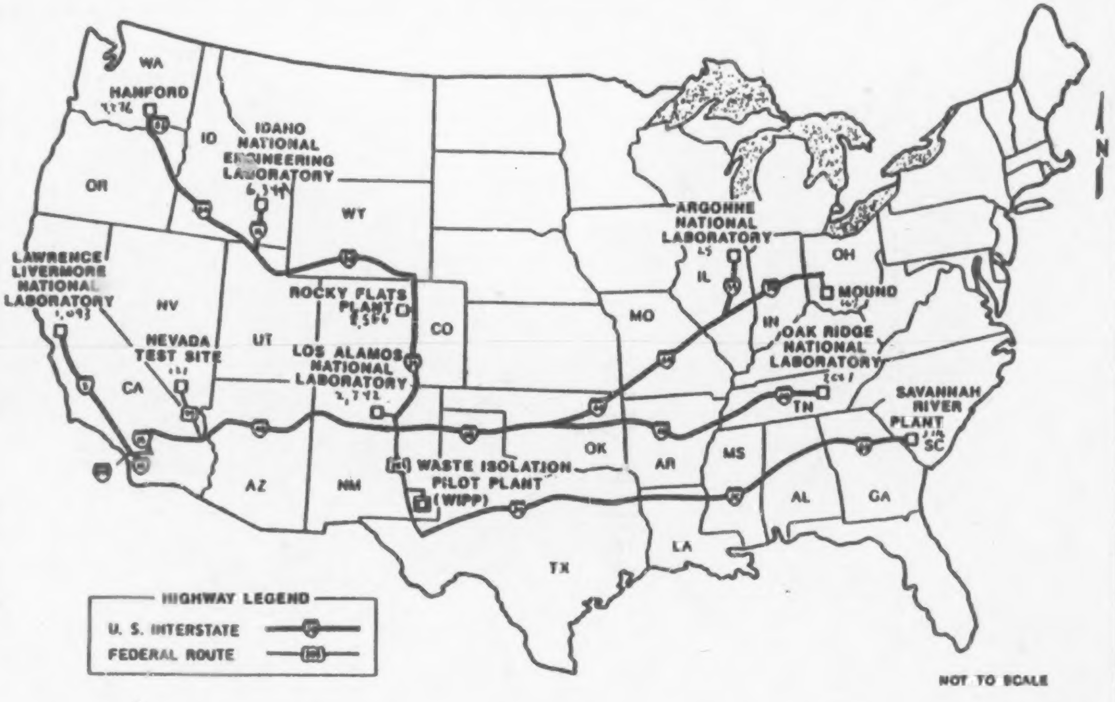
Living with the constant fear of a nuclear spill can strain the social fabric of a community, adding additional burden to the societal infrastructure. The costs to our society of young people growing up in the constant fear of waste trucks going past their homes and schools and through their communities are inestimable. In addition victims of any contamination must live in constant fear for their future health.

Perhaps the most absurd aspect of any "economic analysis" of WIPP-related transportation is that we are being asked to put a dollar value on our air, our water, our soil and our future. In a hundred years, clean groundwater may be the most valued resource on earth. A handful of long-forgotten jobs in Carlsbad will be of little comfort to our descendants as they struggle with the nightmare of the nuclear legacy we have left behind.

**If we look at the WIPP project realistically now, we see that it offers us much more risk than profit, more damages than benefits, now as well as for the**

future. In short, WIPP's impact on New Mexico's economy can only be negative, and the attempt to promote the project to us as an economic boon is both misleading and insulting. As stewards of our state's economy and environment, we have a clear responsibility to protect our state from so-called solutions which in reality, only serve to create more problems.

# APPENDIX A


N
WA
HANFORD
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OR
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LAWRENCE LIVERMORE NATIONAL LABORATORY
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NV
NEVADA TEST SITE
131
CA
UT
ROCKY FLATS PLANT
2,566
CO
LOS ALAMOS NATIONAL LABORATORY
2,742
AZ
NM
WASTE ISOLATION PILOT PLANT (WIPP)
TX
OK
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ARGONNE NATIONAL LABORATORY
45
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OH
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OAK RIDGE NATIONAL LABORATORY
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GA
SAVANNAH RIVER PLANT
214
SC
HIGHWAY LEGEND
U. S. INTERSTATE
FEDERAL ROUTE
NOT TO SCALE

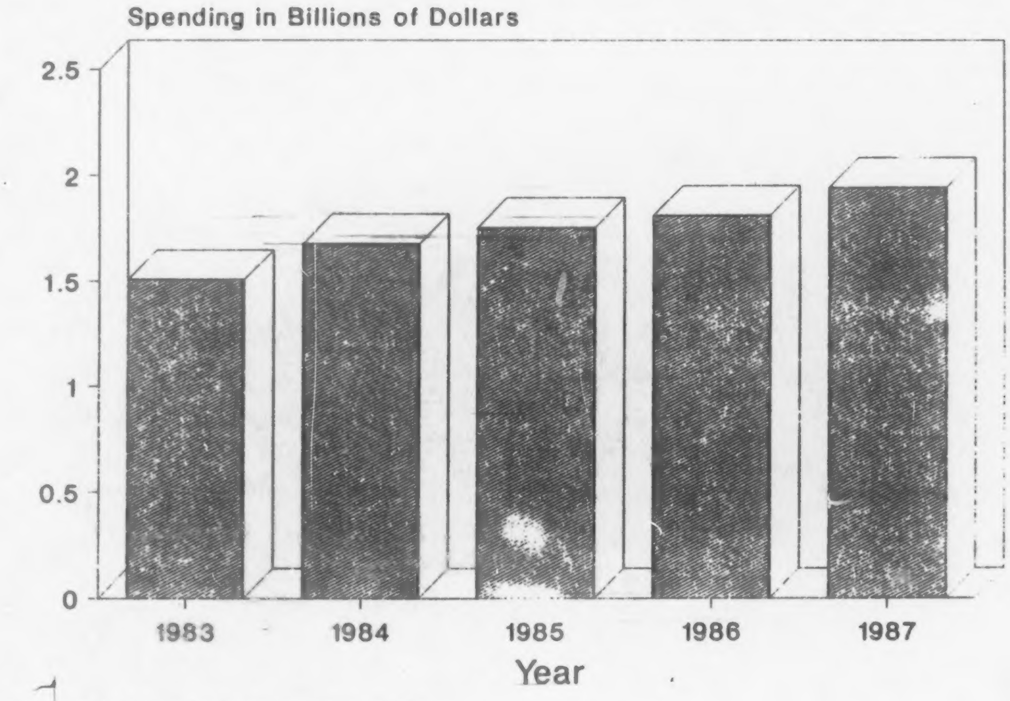
34,144 Shipments

FIGURE 3.5
PROPOSED TRU WASTE TRUCK TRANSPORTATION ROUTES

# APPENDIX B

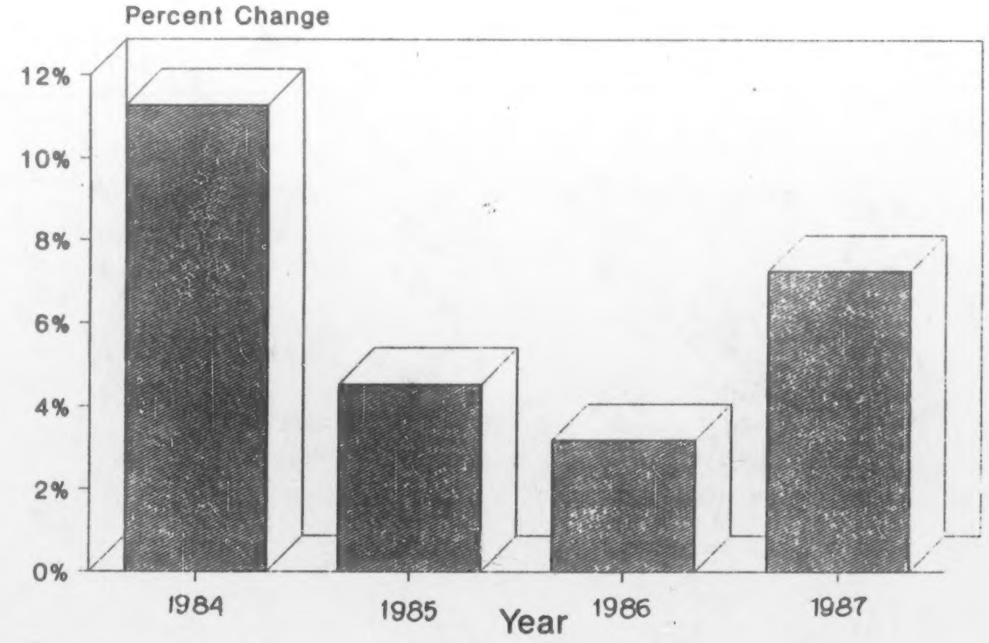
#1

Tourist Spending in New Mexico



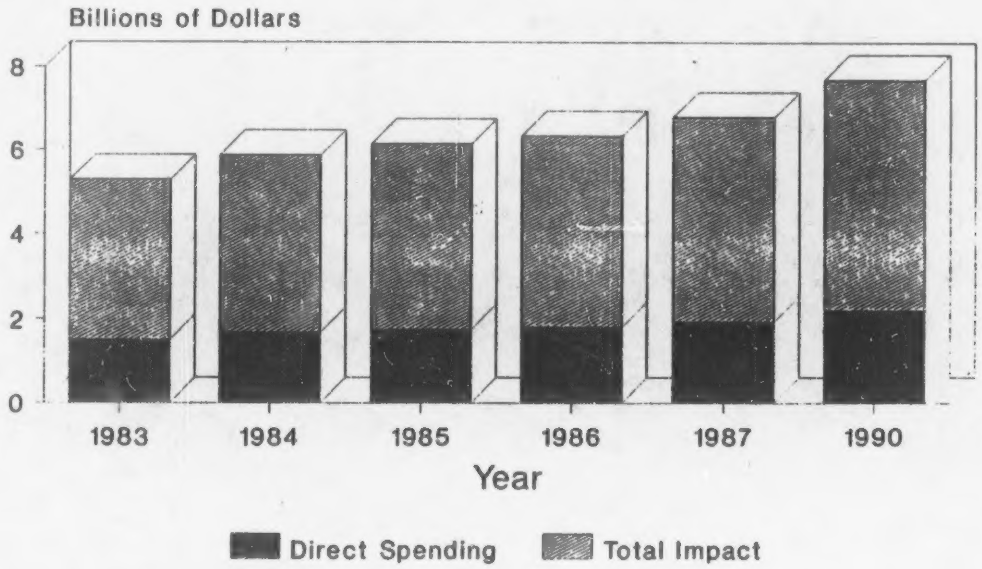
Source: US Travel Data Center, 1988.

Growth in NM Tourist Spending
Over Previous Year



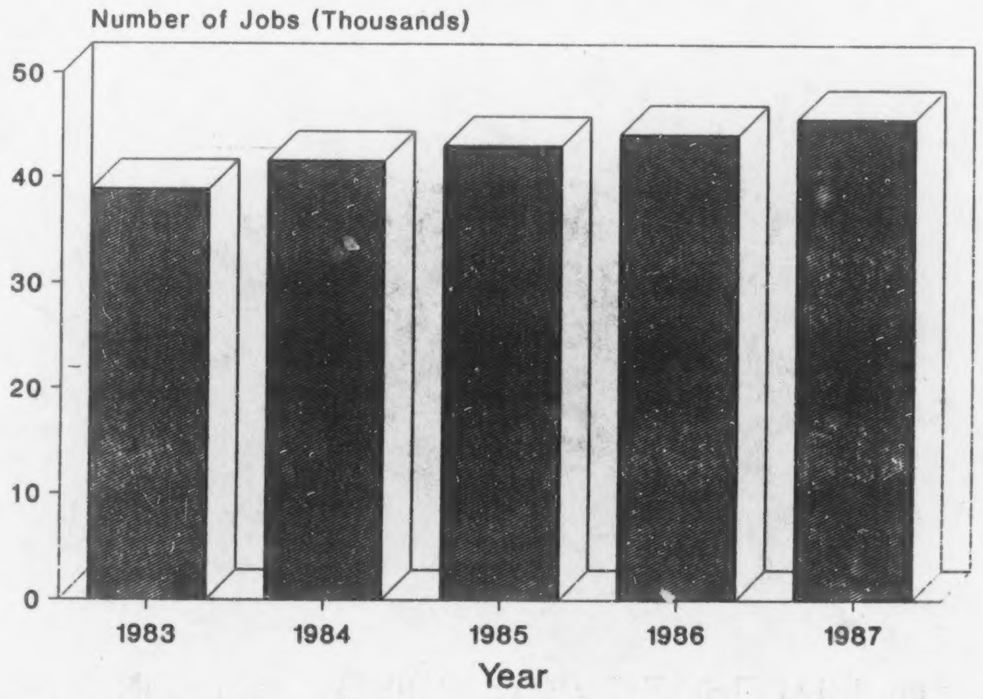
Source: US Travel Data Center, 1988.

Direct and Multiplicative Effect of Tourism on the New Mexico Economy



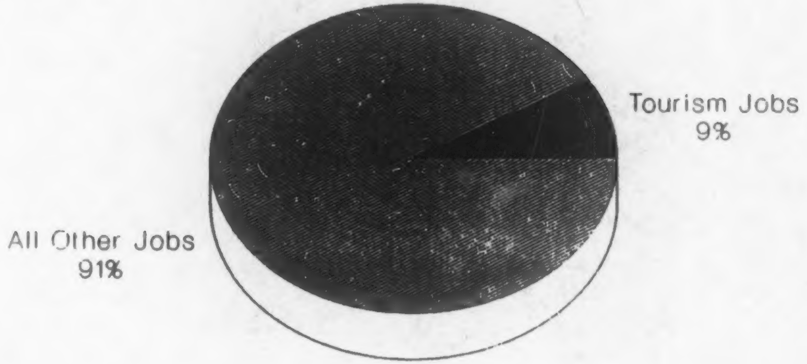
Source: US Travel Data Center, 1988,
and Economic Impact of the Arts in NM,
Av Shama and Associates, 1986.

Tourism Jobs in New Mexico

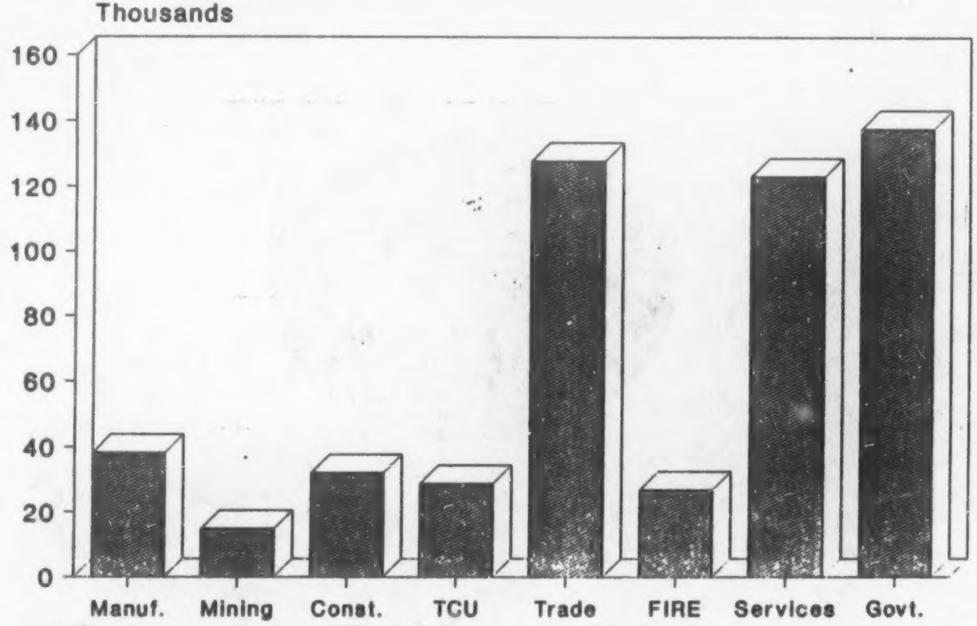


Source: US Travel Data Center, 1988.

## TOURISM JOBS AS A PERCENT OF ALL NM NON-AGRICULTURAL EMPLOYMENT



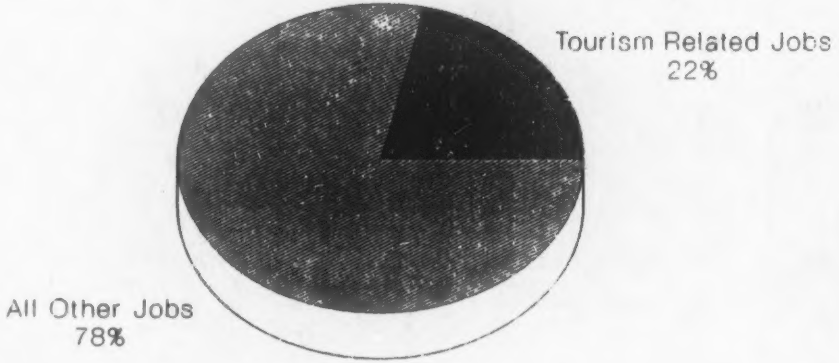
Source: US Travel Data Center, 1988,
NM Department of Labor.



NEW MEXICO JOBS BY SECTOR
Non-Agricultural Employment, 1987

Source: NM Department of Labor, 1989.

TOURISM RELATED JOBS AS A PERCENT OF
ALL NM NON-AGRICULTURAL EMPLOYMENT



**Source: US Travel Data Center, 1988, and NM Department of Labor.**

# APPENDIX C

**Esparza/Katz Productions**
11313 Gladwin St., Los Angeles, CA. 90049
FAX (213) 471-4124 (213) 471-6414

AN OPEN LETTER TO THE PEOPLE AND GOVERNMENT OF NEW MEXICO

I write this letter as a concerned citizen and as a businessman who has produced three films and other documentaries in your state: The Milagro Beanfield War, The Ballad of Gregorio Cortez and the Academy Award nominated documentary Agueda Martinez, among them. These films have brought millions of dollars to the New Mexican economy. Equally important, they have helped contribute to unprecedented national interest in the land and people of New Mexico.

I am currently developing three projects set in New Mexico for production in the near future. We are also looking at office space and moving our base of operations to Santa Fe.

However, a major deterrent in our minds as we formulate our plans: the WIPP project. We feel that WIPP will make New Mexico a much less attractive place for film production as well as residence. WIPP may have a similar effect on all members of the film community and could deter production companies from filming in New Mexico. We call upon the citizens and legislators of New Mexico to stop WIPP now.

Sincerely,

Moctesuma Esparza

AN OPEN LETTER TO THE PEOPLE AND GOVERNMENT OF NEW MEXICO:

As a film producer currently working on three separate projects based in New Mexico, I am highly concerned about the WIPP project. Safety hazards posed by WIPP have forced me to reconsider bringing film crews to New Mexico.

Recently, there has been a surge of filmmaking in New Mexico. Increasing numbers of film professionals, from actors and writers to producers and directors, are relocating to your state. These factors have encouraged our production company to consider moving its base of operations from Los Angeles to Santa Fe.

However, WIPP is a major obstacle to our plans. We feel that WIPP could also discourage others in the film business from working or living in your state and it could eventually reverse the growing film industry in New Mexico. I join others in my profession in urging the people of New Mexico to call a halt to the WIPP project.

Sincerely,

Robert Katz

Senator **Bingaman**. Thank you very much.

Don, why do you not go right ahead with your testimony?

## STATEMENT OF DON HANCOCK, DIRECTOR, NUCLEAR WASTE SAFETY PROJECT, SOUTHWEST RESEARCH AND INFORMATION CENTER

Mr. **Hancock**. Thank you, Mr. Chairman. I am Don Hancock with Southwest Research and Information Center, based in Albuquerque. My organization has been working on WIPP for more than a dozen years, and I have been involved in both WIPP and the high level waste program for that period of time as well.

In thinking about my testimony today, I recalled the last time I testified before this Committee on this subject, which was about 30 months ago, in October 1987 at a hearing in Carlsbad.

So I wanted to look and see how well that testimony conveyed with the current situation. What I found in looking at that testimony is the conclusion I gave the Committee at that time remains totally valid, and in fact, the unresolved issues that I mentioned at that hearing are still unresolved.

That conclusion that I said was that any land withdrawal bill is appropriate only when all other outstanding technical, legal and institutional issues are resolved. Those things still have not happened.

So I think the conclusion that I would draw again is still the same one: The land withdrawal bill is premature.

Let me talk briefly about those unresolved issues. The first one which has been talked about to some extent today is compliance with the EPA disposal standards. I am frankly somewhat concerned by the lack of understanding of that issue that has been demonstrated by some of the witnesses today, though.

DOE has known and has said for the last 11 years that they know that they have to comply with these disposal standards. My organization and the Department of Interior raised that issue specifically in 1979 in the draft environmental impact statement on WIPP that DOE prepared at the time, and DOE said in 1980 in their final environmental impact statement that they knew they had to comply and that they would.

In 1984 DOE signed a written agreement with the State of New Mexico saying they would comply with those standards before any waste is brought in. So it is not that the rules of the game have been changing, the problem is that what we have found out is that WIPP will not comply with those standards.

So in that situation what should be done? DOE has a couple of options it seems to me, given that the site does not comply with the EPA standards, even the standards that they are trying to comply with, the 1985 standards. DOE could either abandon WIPP for health and safety reasons, or secondly, they could develop engineered barrier alternatives that could be used to demonstrate compliance with the standards. They need to make those alternatives, including waste form characterization that has been talked about today, available for scientific and public review before they finalize the decision.

Unfortunately, rather than taking either one of those two reasonable courses, DOE has chosen a third alternative, which is neither scientifically sound or publicly acceptable.

That is the one they describe in the decision plan: Let us go ahead and begin a test phase without showing compliance, let us put the waste in the ground and let us see what happens.

The priority should be to do tests in the test plan that do not require waste, tests that DOE has known should have been done years ago in terms of the characterization of the site, but DOE did not do those. They did not do them because they were in a hurry to construct a repository for disposal that was supposed to be ready in 1986 or in 1988 and still is not ready.

The concern that is now happening, and again, I think unfortunately we have seen some examples of it this morning and this afternoon, as well as with some other DOE-related bodies and other bodies is, since the site does not meet the old standards, there must be something wrong with the standards. So the attack is being mounted to change those standards, to make them less stringent.

Well, unfortunately, those 1985 standards were not too stringent, quite the contrary. In 1987 the First Circuit Court of Appeals found that they were not stringent enough, and they would have to be revised.

So I think the history of waste management health data and impacts on people show that, as we go forward, tighter standards are going to be required. WIPP does not comply with the old standards that were thrown out. Is it likely to comply with new ones? Certainly not, without the kind of engineered barriers and waste treatment that would be necessary.

The second unresolved issue is that NEPA compliance is not yet completed. My organization, CCNS, the State of Texas, the Environmental Defense Fund and the Natural Resources Defense Council all have advised the Department of Energy that—on March the 5th of this year—that we consider that final supplement to the EIS to be technically and legally inadequate. And I attached to my testimony our brief comments in that regard that were sent to the Secretary.

The third unresolved issue is the transportation safety requirements have not been completed. Again, there is a long history, some of which has been discussed. One of the issues that has not yet been discussed which we have raised and people from a number of other states have raised that is not addressed in the decision plan adequately and certainly is not addressed in DOE's proposed bill is that emergency response, training and equipment must be in place in all 23 states that WIPP shipments will be going through before waste is shipped. And a commitment must be made to maintain that training and equipment throughout the life time of the project. DOE has refused to do that.

Regarding transportation safety, there are a couple of other things that need to be said. You have heard some discussion about the wonders of the TRUPACT II container from both Secretary Watkins three weeks ago and witnesses today. Unfortunately, what none of them told you, although Mr. Neill obliquely referred to it is the fact that on April 3rd of this year the Nuclear Regulatory Commission issued a notice of nonconformance on those TRUPACTs.

Those TRUPACTs cannot be used and will never be used, and the issues that NRC identified have still not yet been resolved. So to argue that the TRUPACT somehow is perfectly safe and working well does not comply with the facts.

The fourth unresolved issue relates to compliance with RCRA, and I think we have already heard to some extent about where we are with that. Again, it is distressing sometimes to note that some people would argue that either WIPP should be exempt from RCRA, or WIPP and Yucca Mountain should be exempt from RCRA altogether, or otherwise RCRA should somehow be modified to fit WIPP. Designing standards to meet facilities is not going to inspire public confidence, nor is it scientifically valid.

Briefly, I have already mentioned that there are numerous problems with the decision plan itself. The current version of the decision plan mentions the compliance report with those EPA disposal standards. My organization continues to believe that DOE legally can proceed with experiments without waste only.

In order to bring any waste to WIPP they have to first complete a performance assessment and demonstrate compliance with those standards.

Regarding NEPA, the decision plan is at odds with the Department's own position. The decision plan says that NEPA compliance ends with the record of decision on the environmental impact statement supplement that was issued in January. That document itself says that that is not the end of NEPA compliance; there will be yet another supplement. So one way or another the Department needs to clarify what its position is.

Transportation safety issues have not been adequately addressed. The plan assumes that waste shipments can proceed without the highway upgrading occurring, without bypasses being built, without emergency training and equipment and response being in place. That is totally unacceptable to people throughout the country.

The decision plan assumes that the no migration variance will be granted. It may not be. What is DOE's option then? The only option we have heard was the one suggested today that maybe WIPP should not comply with RCRA.

Finally, it is interesting to note that Secretary Watkins promised on June 27th of last year that he would "not be driven by arbitrary schedules." We would agree with that. However, the decision plan itself looks all too clearly like establishing arbitrary schedules itself.

I think, finally, I have already said that the land withdrawal bill is premature and the current vehicle that DOE has proposed is totally unacceptable. I would unfortunately have to note that DOE has apparently withdrawn from agreement of a number of provisions that they concurred with in S. 1272, the bill that this Committee reported out a couple of years ago, and again, we have to wonder why those provisions are no longer acceptable to DOE or at least appear not to be, given the nature of their bill.

There seems to be, as a final statement, the impetus for starting the test phase seems to be that we are in a hurry. We are in a hurry to do what is the question. I hope we are going to be in a hurry for once to have the Department of Energy comply with health and safety requirements, as opposed to either being exempt from them or being able to self-certify their own compliance.

We have had 45 years of that with unhappy results that I think everybody will agree with that.

Thank you, that will conclude my testimony.

I would like, with your permission, Mr. Chairman, to ask Melinda Kassen, who is an attorney with the Environmental Defense Fund, who is involved in a number of things related to WIPP, including the appendix that I attached with the information on the TRUPACT quality assurance and the environmental impact statement, who is present today, to respond to a question that I could respond to. But since she is the lawyer, it seems to me it would be more appropriate for her, and that is related to some questions earlier today about can a state veto something like WIPP on the basis of RCRA permitting. If it would be appropriate, I believe she could provide a quick answer for the record that would help that.

Senator BINGAMAN. Maybe she could do that in writing. That was a question I think Senator McClure asked, which I am not particularly caught up in myself. If she could present that for the record, we would be glad to receive that.

[The prepared statement of Mr. Hancock and response from Ms. Kassen follow:]

SOUTHWEST RESEARCH AND INFORMATION CENTER

# STATEMENT OF DON HANCOCK

# REGARDING THE WASTE ISOLATION PILOT PLANT (WIPP)

BEFORE THE

SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

THURSDAY, APRIL 26, 1990

WASHINGTON, D.C.

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Good afternoon, Mr. Chairman and members of the Committee. Thank you for the opportunity to testify. I am Don Hancock, Director of the Nuclear Waste Safety Project at Southwest Research and Information Center (SRIC), a nonprofit educational and scientific organization based in Albuquerque, New Mexico. SRIC has been actively involved with WIPP for more than 12 years. We also have actively participated in DOE's high-level nuclear waste program.

I last testified before the Committee on October 12, 1987, at its field hearing in Carlsbad, New Mexico. While some important new information about WIPP is now available — much of which raises additional problems to the opening of WIPP — and while some aspects of DOE's program have improved during the past 30 months, SRIC's fundamental conclusion expressed at that hearing has been shown to be valid. That same conclusion remains valid today.

That conclusion is that any land withdrawal bill is appropriate only when all other outstanding technical, legal, and institutional issues are resolved. Although in October 1987 DOE was promising solutions by September 1988, none of those major unresolved issues has yet been satisfactorily addressed. Based on past experience, those vital issues will not be resolved during 1990, or in the near future.

My testimony today will review the unresolved issues, comment on the DOE's Draft Decision Plan for WIPP, and briefly discuss the DOE's land withdrawal legislation.

## I. UNRESOLVED ISSUES

### 1) WIPP has not been shown to meet the EPA disposal standards.

In fact, DOE's date for complying with those standards (40 CFR 191) has slipped dramatically until at least 1994. To briefly review the relevant history, DOE has been aware of the need to comply with those EPA standards for more than a decade. In the WIPP Final Environmental Impact Statement (EIS) of October 1980, DOE stated:

> "Issue: The DOI and several public-interest groups said that the development of the WIPP project must take into account EPA regulations for radioactive-waste repositories. Since the EPA regulations have not yet been promulgated, the WIPP project may need to be delayed until they become available.
>
> Response. The design of the WIPP to date has been consistent with the EPA draft criteria for radioactive wastes published in the Federal Register on November 15, 1978. If alternative 2 is chosen [and it was], the WIPP design will be modified as necessary to comply with legally applicable EPA rules and regulations promulgated in the future." (p. 15-13)

In the First Modification of the Stipulated Agreement, signed in November 1984, and approved by DOE Secretary Hodel on January 18, 1985, DOE agreed:

"In carrying out this stated mission, DOE and WIPP will comply, at a minimum, with all applicable state, federal and local standards, regulations and laws, including any applicable regulations or standards promulgated by the Environmental Protection Agency (EPA)."

In my October 1987 testimony, I stated that the only logical reason for DOE to reject full compliance with the EPA disposal standards was that it cannot demonstrate compliance. In support of that conclusion, I would note that DOE now acknowledges that WIPP will not meet the EPA standards that were promulgated on September 19, 1985. That analysis has been noted by (among others) the National Academy of Sciences' WIPP Panel (NAS), the Blue Ribbon Panel, and the Advisory Committee on Nuclear Facility Safety. That analysis is contained in the closest thing to a preliminary performance assessment that is publicly available on WIPP from DOE (SAND 89-0462--Systems Analysis, Long-Term Radionuclide Transport, and Dose Assessments, Waste Isolation Pilot Plant (WIPP), Southeastern New Mexico, March 1989). In two of the four release scenarios in the draft Supplement to the WIPP Environmental Impact Statement (SEIS), radionuclides escaping from the site would exceed the limits in the EPA standard by 2.5 and 4.9 times. In one of the two revised calculations in the final SEIS, releases would be more than 3 times the limits in the old EPA standard.

Thus, it is undisputed that WIPP has not been shown to comply with the EPA standards. Moreover, the available evidence indicates that WIPP will not comply with the previous standards, which were invalidated by the court as being inadequate. Given the current situation, DOE should either (1) abandon WIPP for health and safety reasons or (2) develop engineered barrier alternatives that could be used to demonstrate compliance with the standards — and make those alternatives subject to scientific and public review.

Rather than taking either of those two reasonable actions, DOE's final SEIS and Draft Decision Plan propose a third alternative which is neither scientifically sound nor publicly acceptable. That alternative is to begin loading wastes into WIPP for a "Test Phase." Most of the tests described in the "Draft Final Plan" (DOE/WIPP 89-011, December 1989) do not include radioactive wastes. Many of those tests could have been and should have been done years ago. The tests were not done because DOE was too busy constructing the repository to allow the time, money, and opportunity necessary to conduct scientific tests. The priority was to construct the repository to meet an opening date of 1986 (in the FEIS) or 1988. Those tests that use radioactive wastes are not necessary to demonstrate compliance with the EPA standards (which do not require such experiments) and will not prove that the site meets the requirements of the Resource Conservation and Recovery Act (RCRA).

SRIC said in its 1987 testimony that there was no technical or legal basis to allow 15 percent of the total volume of wastes bound for WIPP to come in a Test Phase, which was DOE's proposal at the time. DOE has yet to show an adequate technical or legal basis for the new test program. For example, DOE has not published the results that it expects to receive from the various tests with wastes, it has not described how it will use actual data that varies from those expectations, it has not described how it will revise its computer models when actual data differs from the expected results. DOE just wants to put waste in the ground to see what happens and then to figure out what to do with the data — and the waste.

At the committee's hearing on April 3, Leo Duffy testified that retrievability will not be shown until at least 1992. So DOE is asking everyone to have faith that what wastes it puts in, it can and will take out. The public does not have such faith in DOE.

DOE also may be involved in an attack on the EPA standards as being too stringent, particularly the human intrusion scenario. Some groups, including the Advisory Committee on Nuclear Facility Safety and the National Academy of Sciences, while acknowledging that WIPP will not meet the 1985 EPA standards, are questioning the standards themselves. Those groups appear to be responding to concerns expressed by DOE.

Those 1985 EPA standards are not too stringent — quite to the contrary. In 1987, the First Circuit Court of Appeals found that the standards were not stringent enough. DOE, EPA, nor anyone else now should think that weaker standards will be adequate to protect public health and safety and to satisfy public concerns. The history of radioactive wastes has shown that health data will support and the public will demand even stricter standards. Future generations will not likely support anything less than a "zero release" standard for nuclear waste repositories.

2) NEPA compliance for WIPP is not yet completed.

While we were pleased that DOE finally agreed to issue a SEIS, we strongly believe that the final supplement is not adequate. DOE seems to agree since it has already committed to issuing an additional supplement. We disagree with the premise, however, that DOE can proceed with bringing any wastes to WIPP without completing an adequate SEIS. Moreover, as long as DOE continues to maintain that WIPP is part of the cleanup of DOE facilities (not an obvious fact, given that WIPP is not supposed to handle any of the buried, leaking wastes at DOE facilities), decisions about WIPP should await completion of the programmatic EIS, for which the scoping process has not begun.

SRIC, CCNS, the State of Texas, the Environmental Defense Fund, and the Natural Resources Defense Council notified DOE on March 5 that we consider the final SEIS to be technically and legally inadequate (Appendix 1). SRIC hopes that DOE will not proceed to issue a new Record of Decision until a new, adequate SEIS is completed.

3) Transportation safety requirements are not completed.

DOE has committed itself to safe transportation, but its performance has not lived up to its promise in the areas of highway upgrading and bypasses, emergency response training and equipment, and shipping containers.

In the 1982 Supplemental Stipulated Agreement with the State of New Mexico, DOE committed to providing funds to upgrade highways, but less than 60 percent of the required money has been made available, and the required upgrading has not been completed. That upgrading, along with the bypasses promised in the 1987 Second Modification to the Consultation and Cooperation Agreement, should be in place prior to any wastes being shipped to WIPP. It is certainly not appropriate for the Secretary of Energy to renege on the promises in those agreements.

Emergency response training and equipment must be in place in all states along WIPP transportation routes before any waste is shipped and must be maintained throughout the lifetime of WIPP. Given the turnover among first responders, such training and equipment must be provided continually throughout the lifetime of WIPP. As an alternative to continuously training thousands of first responders, DOE should consider dedicated escort vehicles for each WIPP shipment that would carry trained first responders with equipment adequate to handle any accident. In addition, emergency room personnel in hospitals need training, equipment, and medicine to treat accident victims.

After wasting more than $25 million on the TRUPACT-I shipping container and about $4 million on building a rail spur to the WIPP site, in 1987 DOE finally agreed to have the new TRUPACT-II truck shipping container certified by the NRC. Unfortunately, DOE refused to have its quality assurance (QA) program reviewed by NRC as any licensee must do (Appendix 1, Exhibits A & B). SRIC supports a re-certification of the TRUPACT-II, including NRC review of the DOE QA program. The advisability of such a requirement has been demonstrated by the fact that DOE's QA program did not uncover the improper manufacture of the container until 15 TRUPACT-IIs were completed, some with welds less than a tenth of an inch thick. The new shipping container to be developed for RH-TRU waste should be subject to full NRC certification, including the QA program, and full NRC inspection of the manufacturing, handling and maintenance of the package throughout its lifetime.

4) WIPP is not in compliance with RCRA.

There is no question that the mixed wastes coming to WIPP are subject to regulation under RCRA, and Congress should not exempt nuclear waste repositories from those requirements. But DOE has been extremely slow to comply with that law. Rather than complying with the waste treatment requirements of RCRA, DOE has sought a first-of-its-kind no migration variance. SRIC does not believe that EPA can grant such a temporary variance because it is incompatible with the congressional intent that no migration would ever occur. Under EPA's interpretation, many inadequate sites might demonstrate "no migration," at least as EPA currently defines it, for five years. Moreover, EPA must have final regulations governing such variance requests before it can determine whether an application does or does not comply with the regulations.

The RCRA requirements, the technical problems with the WIPP site, and the need to improve safety at the existing storage sites require that treatment alternatives be carefully examined before WIPP proceeds.

## II. DOE's Decision Plan

The Draft Decision Plan does not adequately resolve those major unresolved issues. The original October 11, 1989 version of the plan did not address compliance with the EPA standards. The current version (Rev. 2A-March 11, 1990) mentions only a compliance report, not actually complying with Subpart B before any wastes are emplaced. SRIC continues to believe that DOE legally can proceed only with experiments without waste in order to prepare its performance assessment and that no wastes can be brought to WIPP until compliance with 40 CFR 191 is demonstrated.

Regarding NEPA compliance, the Plan does not conform with DOE's own position in its final SEIS, since the latter document states that NEPA compliance will not be complete until after the Test Phase when a new supplement will be prepared, while the Decision Plan shows NEPA compliance ending in April 1990 with the Record of Decision on the final SEIS.

Transportation safety issues are not adequately addressed in either the Decision Plan or in Secretary Watkins' testimony of April 3. The Plan assumes that waste shipments can proceed without highway upgrading and bypass money being available, and without the roadways actually being constructed. In the Draft Decision Plan emergency response training and equipment is shown as ending in May 1990, without any provision to require such training and equipment throughout the lifetime of WIPP.

The Decision Plan, like the SEIS, assumes that the no migration variance will be granted, which it may not be. DOE is making no provision for initiating waste treatment. The Plan also assumes that the Test Plan can proceed at WIPP and is making no provision for beginning bin-scale experiments at the DOE generator facilities to address the gas generation problem — something that should have begun years ago.

In sum, we find that Decision Plan to be seriously deficient. Moreover, contrary to Secretary Watkins' promise of June 27, 1989 that he "would not be driven by arbitrary schedules," the Decision Plan essentially is just another arbitrary schedule.

## III. Land withdrawal legislation

As I have already testified, given the many vital unresolved issues, serious Congressional consideration of land withdrawal legislation is premature. SRIC would further request that given the unprecedented nature of a land withdrawal for a nuclear waste repository and the great interest about WIPP in New Mexico, that the committee hold a field hearing in New Mexico (in Albuquerque or Santa Fe where no such hearing has yet occurred) as part of consideration of any land withdrawal bill, as it did in the last Congress when considering S. 1272.

In addition to the difficult unresolved issues, we would also note that DOE has not completed many of its own requirements for WIPP's opening listed in the Decision Plan, including completing the Final Safety Analysis Report (including showing compliance with 40 CFR 191, Subpart A in that document, not in some subsequent addendum), acquisition of an outstanding potash lease, completion of the hoist repair, and demonstrating retrievability.

Finally, we would note that the DOE's proposed land withdrawal legislation is a totally inadequate vehicle because it does not include many requirements that DOE previously had agreed to in S. 1272, which this committee reported out in 1988.

Thank you very much for the opportunity to testify. I would be glad to respond to any questions.

ENVIRONMENTAL DEFENSE FUND

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March 5, 1990

James Watkins, Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

RE: Final Supplement, Environmental Impact Statement, Waste Isolation Pilot Plant, DOE/EIS/0026-FS

Dear Secretary Watkins,

In July 1989, the undersigned Concerned Citizens for Nuclear Safety, the Environmental Defense Fund, Southwest Research and Information Center and the Attorney General of the State of Texas, (joint commentors) along with the Natural Resources Defense Council, filed extensive comments on the Draft Supplement, Environmental Impact Statement (D-SEIS) for the Waste Isolation Pilot Plant (WIPP). DOE responded to some of our critical comments and incorporated some of the changes we suggested in the Final Supplement (SEIS). However, having reviewed the SEIS to the extent possible in 30 days, we believe that it does not comply with the law, continues to be insufficient in many respects, has yet to consider all reasonable alternatives to the Proposed Action and forms an inadequate basis for an informed determination as to whether to proceed with the emplacement of transuranic (TRU) waste at WIPP.

Rather than again submit extensive comments on all of the failings of the SEIS, the joint commentors today offer the following general critique of the document. This limited listing of the remaining, yet substantial inadequacies in the SEIS should nonetheless make clear that the SEIS and the associated public participation process have been fundamentally flawed. We are concerned that the resulting decision about waste emplacement will be, as well. Therefore, we again urge you to reissue the SEIS in draft for additional public comment and correction.

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### 1. DOE has violated the National Environmental Policy Act (NEPA) by failing to allow the public to comment on new information in the SEIS.

The WIPP SEIS contains substantial new and different information from that set forth in the D-SEIS on which DOE did provide the public an opportunity for comment. For example, DOE has added several entirely new Appendices, including Appendix O which purports to describe the Test Phase that is at the heart of DOE's Proposed Alternative. Also, DOE states both in volume 3 of the SEIS (Response to Comments) and in the new Appendix O that the Test Phase will include backfill. Vol. 3, pp. 264 and 293; vol. 2, p. O-25. (Unfortunately, DOE does not, either in Appendix O or elsewhere in the SEIS, analyze the impacts of doing so, which impacts may include higher risks to workers from retrieving backfilled waste from an alcove for emplacement in a disposal room or for removal from WIPP. Nor has DOE considered the higher costs of retrieving wastes, if it becomes necessary, if the alcoves are backfilled.)

When a final EIS differs substantially from the draft, includes significant new information, or fails to respond adequately to issues raised by the public comments on the draft, the agency will violate NEPA by proceeding with a decision absent its either reissuing a revised draft EIS for additional public comment or allowing the public to comment on the new and/or different information in a final EIS prior to the decision maker issuing a record of decision (ROD). Sierra Club v. Marsh, 872 F.2d 497 (1st Cir. 1989); Appalachian Mountain Club v. Brinegar, 394 F. Supp. 105, 121-122 (D.C.N.H. 1975). Yet, DOE has repeatedly refused to reissue the SEIS as a second draft. Moreover, DOE announced that it intends to issue a ROD as close as possible to 30 days after releasing the SEIS, (see 10/89 draft Decision Plan for WIPP, as amended) while also refusing to seek or review public comments on the SEIS.

The joint commentors object to DOE's failure to solicit and consider public comment on the SEIS, both because the SEIS contains substantial new and/or different information from that in the D-SEIS and because of the dramatic revelations regarding the WIPP project that have come to light since closure of the public comment period on the D-SEIS.

### 2. The SEIS does not correctly describe the Proposed Action, so it does not consider all reasonable alternatives to that Action.

"An agency will not be permitted to narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered." *City of New York v. U.S. Department of Transportation*, 715 F.2d 732, 743 (2d. Cir. 1983). The SEIS has impermissibly limited the description of the Proposed Action, and indeed the representation of how DOE intends to use WIPP, such that it has failed to consider the true range of alternatives thereto.

In the SEIS, DOE states that it "believes that the FEIS (DOE, 1980) and this SEIS evaluate all reasonable alternatives to the Proposed Action." Vol. 3, p. 62. This statement is simply untrue. DOE's current Proposed Action is in fact a thinly veiled plan to use WIPP as a TRU waste storage site for approximately five years for up to 10% of the waste destined for emplacement at WIPP. DOE has done no NEPA evaluation of the alternatives to that proposed action. For example, it has not considered the options for storage elsewhere, including the use of other DOE or DOD facilities for TRU waste storage, development of alternative storage sites, or continuing to store wastes at the existing sites for the next five years while using various treatment, waste reduction and waste minimization practices.

The SEIS admits that prior to the beginning of full scale disposal operations at WIPP, "a new storage facility ... could possibly be needed." Vol. 3, p. 13. The SEIS also concedes that the "costs of compliance [with RCRA] are unknown" although DOE then contends that RCRA compliance is "beyond the scope of this SEIS." Vol. 3, p. 45. Such information is precisely part of the reason for NEPA, to ensure that policy-makers make decisions after considering comparative costs and before the irretrievable commitment of resources.

**3. DOE will violate NEPA if it issues a Record of Decision and proceeds with the WIPP Test Phase based on this SEIS when DOE already plans to issue another SEIS.**

The Executive Summary of the SEIS, at p. iv, announces:

> DOE will issue another SEIS at the conclusion of the Test Phase and prior to a decision to proceed to the Disposal Phase. This SEIS will analyze in more detail the system-wide impacts of processing and handling at each of the generator/storage facilities and will consider the system-wide impacts of potential waste treatments.

Because DOE has already determined that another SEIS (SEIS-II) will be necessary regardless of what information the Test Phase reveals, *see also* vol. 1, p. 3-33, the joint commentors believe that the instant SEIS is per se inadequate, because DOE intends to commit -- irretrievably -- additional resources to WIPP without having analysed important aspects of the proposed action.

If DOE intends eventually to use WIPP for permanent disposal of TRU waste, then DOE must now: (a) analyze the system-wide impacts of processing and handling waste at each of the generator or storage facilities, and (b) consider the system-wide impacts of potential waste treatments. If DOE has not yet decided how it will treat wastes bound for disposal in WIPP, then DOE will not be able to use wastes during the Test Phase which have been treated in the way wastes emplaced for permanent disposal in WIPP will be treated. Under such circumstances, how can DOE expect the Test Phase to produce relevant results? And, not knowing what treatment will be used, how can DOE legitimately use Test Phase results to demonstrate compliance with the Environmental Protection Agency (EPA) radioactive waste disposal or RCRA No Migration standards? That DOE does not presently know even the range of treatment alternatives that exist, let alone the environmental impacts of these treatments, is strong evidence that DOE should not be going forward with waste emplacement at WIPP, even "temporarily" for the Test Phase, because DOE may be needlessly contaminating a facility that will never be able to meet all legally applicable standards.

**4. The SEIS does not comply with the core NEPA requirement to consider all reasonable alternatives.**

By committing to do the analyses projected for the SEIS-II, DOE has implicitly admitted that the instant SEIS does not adequately consider all reasonable alternatives to its proposed action. The SEIS-II would, among other things, consider the effects and costs of waste treatment, including incineration and compaction. But DOE already has made the decision to use supercompaction, see vol. 3, p. 12, without providing the required environmental documentation. In essence, DOE's commitment to begin supercompaction at Rocky Flats constitutes at least a partial decision regarding waste treatment, yet DOE has not done the necessary environmental analysis required by NEPA to support that proposal.

The question pursuant to NEPA is whether all reasonable alternatives have been adequately considered before deciding to proceed with major federal action. See, citations in "Joint Comments on the D-SEIS" submitted by the joint commentors and the Natural Resources Defense Council, p. II-1. In this case DOE has recently made several key decisions that significantly affect the quality of the environment without NEPA documentation. Those decisions include:

* using a supercompactor at Rocky Flats (The SEIS argument, at vol. 3, p. 21, that "waste volume minimization at the Rocky Flats Plant is bounded by the analysis in this SEIS" is inapposite given DOE's failure to have analysed alternatives to the supercompactor in this SEIS. Such analysis is necessary because of the implications of compacted waste being emplaced in WIPP, regardless of whether such analysis would be necessary were DOE simply planning to store compacted waste indefinitely at the Rocky Flats Plant);

* providing "some type of treatment" for 30% of the wastes stored at INEL (318,000 cubic feet) before bringing it to WIPP (vol. 3, p. 251);

* making WIPP into a de facto TRU-waste storage site through the artifice of the "operational experiments" for which DOE intends to put into WIPP as much as 10% of the total amount of waste eventually expected for permanent emplacement there; and

* using trucks for the first 5 years of shipments to WIPP. (The contract with the truck company was signed at a time that the only WIPP NEPA analysis [the 1980 FEIS] said that 75% of the shipments would be by train. And, DOE admits that it signed that contract without making a "safety comparison" between train and truck shipments. Vol. 3, p. 114. The agency still has not explained why it chose the transportation mode that by its own analysis kills and injures more people than would leaving the wastes in place or transporting them by train.)

**5. DOE has incorrectly rejected the No Action Alternative as "unacceptable."**

DOE claims that the No Action alternative is "unacceptable" while admitting that "DOE would provide effective monitoring and maintenance of storage facilities, adverse health effects for the general public would be quite small and the principal adverse, effects, also small, would be related to occupational activity at the facilities." Exec. Sum., p. S-9. DOE provides essentially two reasons why it is rejecting this alternative. First, "DOE would have to build treatment facilities meeting land disposal requirements [under RCRA] for TRU mixed waste," and second it "would not result in the demonstration of the safe disposal of TRU waste." Id.

With regard to the first reason for rejecting the No Action Alternative, the joint commentors respectfully note that, given the estimated five year test phase, the relatively limited quantity of waste (compared to that existing amount of waste in storage) that will be placed into WIPP during the first several years of Test Phase, and the uncertainty surrounding DOE's obtaining a No Migration Variance from the land disposal restrictions (LDR) at WIPP, the same objection should hold true for DOE's Proposed Action. This, then, cannot be a reason to reject the No Action Alternative and not do so as well with the Proposed Action.

As for DOE's second justification for rejecting the No Action Alternative, again the joint commentors must respectfully point out that the Test Phase will not necessarily result in a demonstration of DOE's ability to dispose of TRU waste safely. All that DOE contends will occur between now and SEIS-II is a series of tests the results of which may or may not show that WIPP can meet EPA radioactive waste disposal and RCRA No Migration standards. The likelihood is, in fact, that DOE will end up using the SEIS-II to explore what waste treatments and engineering barriers will be necessary for WIPP to comply with these federal requirements. Given that DOE is likely to need to pursue either treatment or engineered barriers, or both to ensure WIPP compliance, there is no reason why DOE could not pursue either the Alternative Action or the No Action Alternative while simultaneously working on waste treatments (which DOE is going to have to do anyway to stay in compliance with the LDR in the interim) and engineered barriers.

**6. The SEIS misrepresents several of DOE's own positions that are set forth in the 1981 ROD.**

a. DOE contends now that proceeding with the Test Phase at WIPP "would not signify that the DOE has determined the WIPP to be a permanent disposal facility." Vol. 3, p. 29. In fact, DOE determined in 1981 that WIPP would be a permanent disposal facility. The 1981 Record of Decision (ROD) states: "The WIPP facility will dispose of defense transuranic (TRU) waste stored retrievably at the Idaho National Engineering Laboratory (INEL)." 46 Fed. Reg. 9162 (January 28, 1981). Since DOE has refused to withdraw the 1981 ROD, see, e.g., vol. 3, p. 23, it is still in force. Clearly the decision to use WIPP as a disposal facility has already been made. What other justification would there be for DOE having spent $800,000,000 on WIPP in the intervening decade? But, if DOE nonetheless continues to assert that it has not decided that WIPP will be its permanent disposal facility for TRU waste, it must withdraw or modify the 1981 ROD.

b. The SEIS states that "DOE has withdrawn the 1980 proposal to conduct high-level waste experiments in the WIPP." Vol. 3, p. 64. However, the decision to do high level nuclear waste (HLW) experiments is included in the 1981 ROD -- "WIPP will include an experimental facility for conducting experiments on ... defense high-level waste." 46 Fed. Reg. 9162 (January 28, 1981). Thus, until the 1981 ROD is withdrawn and or expressly superceded by a new ROD that explicitly states that HLW will not be used for experiments or disposal at WIPP, the joint commentors are concerned that DOE or some other entity could argue in the future that the original ROD's determinations remain valid. In fact, in contrast to the SEIS assertion quoted in the preceding paragraph, one finds in the same SEIS volume at p. 260 this statement: "high-level radioactive waste experiments could become useful at a later time." This latter declaration appears to support the idea that DOE still would consider using WIPP for HLW experiments (if not HLW disposal).

**7. The SEIS does not respond to all comments received on the D-SEIS.**

The SEIS incorrectly states that "all comments received were carefully evaluated, and responded to in this SEIS." Vol. 3, p. 19. DOE failed both to respond to many comments received, including some made by the joint commentors, and to respond adequately to many others. Examples of those deficiencies, in addition to issues already raised above, include the joint commentors' requests for an analysis of what would occur were WIPP not to comply with the EPA repository standards; consideration of additional information regarding releases into the Pecos River; the methodology for predicting socioeconomic impacts and the assessment of such impacts to Texas; and the impacts of the Test Phase. Joint Commentors' Comments on the D-SEIS, pp. X-5, VI-5 and 7-8, VII-7-9 and -11, and IX-2, respectively; see also, 40 C.F.R. 1503.4.

In addition to the legal requirement to consider all comments, the SEIS also reflects the DOE's contempt for scientific data. The manner in which DOE rejects Dr. Gofman's analysis of radiation exposures, see No. 9, below, and many commentors invocation of the Petkau Effect, e.g., vol. 13, p. 456, is one such example. In addition, DOE rejects out-of-hand public opinion that does not agree with the agency's position. As one example, the SEIS on several occasions states that there is "no evidence" or "DOE has not identified any evidence" of adverse effects on businesses and tourism from waste transportation. DOE clearly -- and with no justification -- therefore ignores dozens of statements by individuals and businesses during the public hearings that such adverse effects would occur. See, e.g., Statement Richard Johnson, vol 7, pp. 102-106. Such a statement is evidence; DOE must treat it as such.

**8. The SEIS misrepresents the nature of DOE's quality assurance program for transportation.**

The SEIS explicitly states that "WIPP would be required to comply with ... the NRC [Nuclear Regulatory Commission] and DOT [Department of Transportation] packaging and transportation requirements." Vol. 3, p. 58. That statement is incorrect. The Environmental Defense Fund and Southwest Research and Information Center have previously pointed out that DOE has refused to meet NRC transportation requirements for quality assurance (QA). See, SRIC letter to Secretary Watkins, dated August 9, 1989 and attached hereto as Exhibit A. DOE's response of September 7, 1989 (attached hereto as Exhibit B), confirms what NRC personnel had previously admitted at a July 20, 1989 meeting, namely that NRC was neither asked nor allowed to do the normally required QA reviews for TRUPACT-II. The current problems with the manufacturing of the TRUPACT-II -- where welds less than 0.1 inches thick have been discovered -- is but one example of the need for an adequate QA program throughout the lifetime of the WIPP project. Therefore, the joint commentors continue to believe that a new QA program for TRUPACT-II must be developed, reviewed by NRC, and implemented with on-going monitoring by NRC and/or state officials.

**9. The risks associated with projected Radiation Exposures resulting from waste operations at WIPP continue to be grossly underestimated.**

The SEIS still fails to justify the numerical values used to calculate risk from incident-free transportation to people involved in both transporting and storing contact- and remote-handled TRU waste. In the SEIS, DOE used estimates of excess cancer risk per person-rem found in the BEIR-III and UNSCEAR reports. Not only have these reports been roundly and persuasively criticized by John W. Gofman, M.D. but the recently released BEIR-V report, which incorporates the most thorough and up to date radiation studies available, predicts a cancer risk at least four times greater than BEIR-III. Yet, the SEIS openly disregards BIER-V. Finally, the DOE both misused risk values by neglecting to consider the strong age dependence of radiation-induced cancer risk -- a fact DOE admits in the SEIS, vol. 3, p. 178 -- and presented risk calculations in a manner which minimizes the perception of risk. For specifics on these points, see Exhibit C, attached hereto.

*****

In sum, notwithstanding its length, the SEIS still fails to comply with NEPA. Thus, the joint commentors urge you, as the ultimate decision maker, not to issue a ROD announcing DOE's intent to proceed with the test phase based on this SEIS. We are encouraged by your commitment to operate DOE in conformance with all relevant legal requirements, particularly, as you pledged in your ten-point initiative of June 27, 1989 to improve "the way DOE complies with NEPA." Following so closely after that announcement, the ROD for WIPP will serve as precedent for how you will implement that pledge. To demonstrate that this commitment was not just one of words, but of deeds, you must defer any decision on bringing waste to WIPP until there is evidence that the facility can operate safely and comply with all legally applicable environmental standards, including 40 C.F.R. 191, and those promulgated pursuant to RCRA and the Safe Drinking Water Act and that the public participation process has been open, honest and meaningful.

Sincerely,

Michelle Merola
Michelle Merola
Executive Director
Concerned Citizens for
Nuclear Safety

Melinda Kassen
Melinda Kassen
Senior Attorney
Environmental Defense
Fund

Renea Hicks
Renea Hicks
Assistant Attorney General
Office of the Texas Attorney
General

Don Hancock
Don Hancock
Director
Southwest Research and
Information Center

Enclosures

EXHIBIT A

**SOUTHWEST RESEARCH AND INFORMATION CENTER**
Albuquerque office: P.O. Box 4524, Albuquerque, New Mexico 87106 (505) 262-1862
Washington office: 2001 O Street, N.W., Washington, D.C. 20036 (202) 457-0545

August 9, 1989

The Honorable James D. Watkins, U.S.N. (Ret.)
Secretary of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Admiral Watkins:

We are writing to express concern about an issue that recently came to our attention. The issue is implementation of effective quality assurance programs for the transportation of wastes to the Waste Isolation Pilot Plant (WIPP) in New Mexico.

As you know, on August 4, 1987 the U.S. Department of Energy (DOE) signed an agreement with the State of New Mexico to abide by "the applicable regulations of the U.S. Department of Transportation and any applicable corresponding regulations of the U.S. Nuclear Regulatory Commission" in transporting wastes to WIPP. (Emphasis added.) In addition, the Department agreed to ship WIPP wastes in NRC-certified packages. We commend the Department for voluntarily agreeing to these terms; NRC's involvement and oversight in this area provides an added measure of assurance to concerned citizens along WIPP transport routes that the shipments of WIPP wastes will be safe.

Earlier this year, DOE submitted an application for certification of its CH TRU shipping container (the TRUPACT II) to the NRC for review. NRC is now in the final stages of reviewing that application. We were surprised and dismayed to learn that NRC has no intention of reviewing DOE transportation-related quality assurance programs for container manufacture, maintenance, or operational handling.

Quality assurance--QA--is defined in the NRC transport regulations as "all those planned and systematic actions necessary to provide adequate confidence that a system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to control of the physical characteristics and quality of the material or component to predetermined requirements." 10 CFR 71.101(a). QA processes generally require that: 1) personnel be trained in QA, 2) activities that affect quality are inspected, 3) QA records, including records documenting the qualifications of personnel performing the activities, are established and maintained, 4) The audits to verify compliance are performed, and 5) corrective action to resolve identified problems is taken.

Because it is widely understood that effective quality assurance is key to safety, NRC regulations prohibit licensees from shipping wastes without Commission approval of relevant QA programs. 10 CFR 71.101(c). We believe this prohibition should extend to DOE and its contractors, as well.

As you have publicly recognized, DOE's record in managing and administering its QA programs is poor. Ineffective QA has been a continuing problem at WIPP, in the Nevada repository program, and at DOE waste generator sites. We now know QA breakdowns have been particularly severe at the Rocky Flats Plant in Colorado. Environmental Protection Agency inspections there have revealed that waste drums were improperly certified (i.e., marked with incorrect chemical compatibility codes) and, as a result, no one can be sure of exactly what is contained in individual waste drums.

We are greatly troubled by the prospect of future waste certification breakdowns. Proper waste certification is going to be essential to transport safety. The wrong mix of gas-producing wastes could lead to explosions during shipment.

The TRUPACT-II Safety Analysis Report, submitted to NRC with the package certication application, contains very detailed quality assurance and quality control procedures for the container. Effective implementation of these complex procedures will be a demanding process and, therefore, particularly prone to human error. NRC's involvement and oversight in this area could help reduce the margin of error.

To its credit, DOE agreed to involve the NRC in approving the WIPP shipping cask for transport. We urge you to request that NRC also review and approve transportation-related QA programs before the cask is put to use. The Commission's involvement in this area will do a great deal to allay public concerns about the risks associated with the WIPP shipping campaign.

Sincerely,

Don Hancock
Don Hancock
Southwest Research &
Information Center

Melinda Kassen
Melinda Kassen
Senior Attorney
Environmental Defense Fund

cc. NRC Commissioners
New Mexico Congressional Delegation
Colorado Congressional Delegation
Congressman Mike Synar

EXHIBIT B

**Department of Energy**
Washington, DC 20585

SEP 7 1989

RECEIVED OCT 10 1989

Mr. Don Hancock
Ms. Melinda Kassen
Southwest Research and Information Center
2001 O Street, N.W.
Washington, D.C. 20036

Dear Mr. Hancock and Ms. Kassen:

Thank you for your letter of August 9, 1989, to Secretary Watkins regarding concerns about the quality assurance (QA) programs for the transportation of waste to the Waste Isolation Pilot Plant (WIPP) in New Mexico.

The Federal regulations state that "... each licensee shall establish, maintain, and execute a quality assurance program satisfying each of the applicable criteria of 71.101 through 71.137 of this subpart ..." (10 Code of Federal Regulations 71.101b). With regard to the TRUPACT-II and the remote-handled cask shipping containers, Nuclear Packaging (NuPac) is the "licensee." The Nuclear Regulatory Commission (NRC) has completed an audit during the design phase and will continue to audit NuPac during the fabrication of the TRUPACT shipping containers. The Department of Energy (DOE) is not a licensee but a user of the shipping containers, as established by the Atomic Energy Act of 1974.

However, DOE and its contractors have QA programs in place which meet or exceed the NRC QA requirements. All generator sites will be required to have QA in place, meeting all the requirements of American National Standards Institute/American Society of Mechanical Engineers Nuclear Quality Assurance-1, and are equivalent to those required by NRC. Each shipping site will have the necessary procedures to cover all physical operations associated with the receiving, loading, closing, and shipping of the containers. Audits of these procedures have been, and will continue to be, conducted by the operating contractor at each site, the responsible DOE field office, DOE Headquarters, and by the Waste Acceptance Criteria Certification Committee, on which the New Mexico Environmental Evaluation Group participates as an observer.

A complete chemical compatibility study has been done to show that there will be no mixture or combination of chemicals in the waste which could lead to explosions during shipment. The results of this chemical compatibility study were included in the TRUPACT-II Safety Analysis Report for Packaging (SARP). The SARP also contains very detailed procedures on what waste can be put into the package for transport. This information has been reviewed by NRC as part of the certification process.

I can assure you that QA is of prime importance in all areas within DOE, including the transportation of waste to the WIPP site. There are numerous checks and balances built into the QA programs that are designed to provide the highest assurance possible. These programs will be used in all aspects of the TRUPACT-II program including manufacture, handling, maintenance, inspection, and transport. This is done to ensure that not only the waste, but the transportation system as a whole, is safe and affords ample protection for the public and the Nation.

If I can be of further service to you in this or other concerns, please let me know.

Sincerely,

John L. Meinhardt
John L. Meinhardt
Acting Assistant Secretary
for Defense Programs

## Exhibit C
to 3/5/90 Letter to Secretary Watkins regarding WIPP SEIS

Prepared by Ulysses Sherman
EDF Scientific Intern
February 1990

**ABSTRACT**

The numerical values used to calculate incident-free risk to people involved in both transporting and storing CH and RH TRU waste must be justified. The DOE used estimates of excess cancer risk per person-rem found in the BEIR-III and UNSCEAR reports in spite of strong criticism of these reports by John W. Gofman, M.D. Even the recently released BEIR-V report, which incorporates the most thorough radiation studies available and predicts a cancer risk at least four times greater than BEIR-III, is disregarded. Finally, the DOE both misused their risk values by neglecting to consider the strong age dependence of radiation induced cancer risk and presented their risk calculations in a manner which minimizes the perception of risk.

Sec. N.1, p. N-1

John W. Gofman, M.D., has criticized the BEIR-III and UNSCEAR (1977) reports in his 1981 book, Radiation and Human Health. He shows that the values for the excess lethal cancers per rem are 10-50 times lower than his own calculations. This is an enormous discrepancy with similarly enormous consequences for the prediction of WIPP health effects. If the DOE plans to use the BEIR-III and UNSCEAR values, please respond to Gofman's critique. A failure to respond can only indicate an inability to defend the BEIR-III and UNSCEAR values and I must assume that Gofman's analysis is correct. Furthermore, the DOE is responsible for defending the report because the DOE chose to use the BEIR-III and UNSCEAR reports instead of Gofman's analysis. The use of BEIR-III and UNSCEAR values without justification indicates that the DOE is using the data out of convenience with no regard to human life.

Sec. N.1, p. N-1

The DOE states that the BEIR-V estimates 800 extra cancer deaths per million person-rem for a population of all ages. What is the age dependence for radiation exposure and how was the whole population dose calculated, i.e. was a weighted average used?

Sec. N.1, p. N-2

The DOE's use of risk factors such as 8.0x10^-4and 2.8x10^-4 excess fatal cancers per person-rem obscures the meaning of these numbers. It would be more enlightening to say that the indicated dose would cause 4% more fatal cancers than normal.

Sec. N.1, p. N-2

Please explain: "The ninety percent confidence limits, based solely on sampling variation, for increased cancer mortality due to an acute whole body dose of 10 rem range from about 500 to 1200 (mean 760) for 100,000 males of all ages and from about 600 - 1200 (mean 810) for 100,000 females of all ages." If this refers to the number of people who die for a single million person-rem exposure to the specified population, please clarify. Furthermore, please explain how 760 and 810 average to give the 800 deaths per million person-rem stated earlier. Also, please list the limits of the excess cancer risk just as the limits of the number of people who will die are listed.

Sec. N.1, p. N-2

The DOE states that, "For low LET radiation such as gamma rays, the consensus is that ..." Whose consensus is referred to? Gofman (1981) disagrees.

Sec N.1, p N-2

The DOE states that the "BEIR-V report indicates that it may be desirable to reduce the estimates given above by a factor of 2 ..." The words "indicates", "may be", and "estimates" do not inspire confidence in the people who are determining the safety of the WIPP. Human lives are at stake. Please indicate: 1) what the DOE intends to do with this "indicated" information, and 2) that other reports (Gofman, 1981) find that low dose quantity and rate do not affect the cancer death estimates.

Sec. N.1, p. N-2

The DOE states that the information contained in BEIR-V is insignificant for three reasons. The first is that the DOE believes it will not increase risk estimates much. But on the same page the DOE cites figures which show that BEIR-V risk estimates are 186% greater than the estimates used in the SEIS. The second reason is that the estimates affect all alternatives. Regardless, the public has a right to know what the expected fatalities will be. Finally, the DOE says it will incorporate new information into another SEIS to be issued in about 5 years, after the test phase. Yet the issue of human welfare begins immediately and we should be aware of the estimated risks even during the 5 year test phase. If we wait until the test phase is complete it will be too late to take any necessary extra precautions.

Sec. N.3.1, p. N-5

What is the DOE's justification for selecting a linear quadratic model? According to Gofman (1981, p. 320), "Dr. Radford, the chairman of the BEIR-III committee, presented a detailed dissenting discussion (pp. 287-314, BEIR-III, 1980) in which he pointed out the lack of scientific justification for the action of the subcommittee in using a linear quadratic model: Radford finds the linear model to be the reasonable one." Has the DOE merely chosen the linear quadratic model because it provides a lower risk estimate of cancer at low doses?

Sec. N.3.1, p. N-6

The DOE bases its risk assessment upon a 10-year latency period with a constant cancer risk thereafter. Although the DOE states that this is in accordance with BEIR-III, there is not unanimous agreement concerning this methodology. In fact, Gofman (1981) claims that the full statistical effects of cancer are not felt until 40 years after exposure. The number of excess cancers per person-rem increases before 40 years and decreases after.

Sec. N.3.1, P. N-7

The DOE based its reassessment of evaluated risks upon a cohort of people all born at the time the WIPP begins operation. Yet even data used in the BEIR-III report indicates vastly greater risk to young children and infants than to adults as a result of radiation. The DOE does not take into account any age dependence in its reassessment and in fact simply uses the whole population cancer risk estimate.

Although the DOE's method might conceivably result in an equal number of deaths, I am confident it would result in a much lower number of years of life lost. This is because young children and infants exposed to radiation have a very high chance of developing a fatal cancer and at an earlier age while adults have a lower chance of developing a fatal cancer and those that do develop would be at an older age, resulting in fewer years of life lost.

Table N.3.2, p. N-10

At the beginning of table N.3.2, the DOE indicates that the external Effective Dose Equivalent (EDE) is zero for the life of the plant. I can only assume that external EDE refers to low LET radiation, which is certainly not zero, even for routine, incident free operations as listed in table D.3.14.

Table N.3.2, p. N-10

One column of table N.3.2 is titled, "Total excess cancer deaths". By the language one would assume this refers to the number of people who will die each year as a result of the WIPP operation. But the total excess cancer deaths for a population of 103,922 (individual age 44) is the same as for a total population of 16 (individual age 109): 4.0x10^-8 excess cancers. Certainly the DOE has misrepresented the effects of WIPP operation. The numbers indicate that the column titled "Total excess cancer deaths" is in fact a measure of the excess cancer risk per person. If this is true, then the DOE's representation of the death toll resulting from WIPP operation is completely wrong. Please label this column correctly and provide a true listing of the deaths which will result from incident free operation.

Table N.3.1, p. N-9

The DOE estimates that there is a 10% chance that one of the 18 radiation workers will die of cancer as a result of working at the WIPP during routine operations. Does the DOE deem this an acceptable risk? Will the workers be made aware of this figure?

The DOE also estimates that there is only a 0.17% chance that a radiatio n worker will develop fatal cancer as a result of an accident. This seems improbable when the incident-free risk is considered. Is this figure weighted for the probability of an accident happening? If so, what is the risk to individuals assuming a 100% chance of an accident - which is quite conceivable considering the history of DOE operations.

Table D.3.8, p. D-51

Please explain how the radiological exposure per CH TRU truck shipment, as shown in table D.3.8, could be greater for non-occupational persons than for occupational persons, as is the case for Oak Ridge National Laboratory and Argonne National Laboratory-East. Same comment applies to RH TRU truck shipments from Hanford Reservation as shown in table D.3.9.

Table D.3.10, p. D-53

In footnote b of table D.3.10 the DOE states that the lifetime radiological exposure due to incident free transportation of CH TRU waste to the occupational population applies only to the transportation crews. Why is there no estimate for the exposure to the waste handlers and inspectors here? What is the estimated exposure to waste handlers and inspectors?

Table D.3.10, p. D-53

From table D.3.10 and D.3.11 I calculate the lifetime radiological exposure from CH TRU waste to the occupational population during incident free transportation to be 1100 person-rem. Using the risk factor of 8.0x10^-4 excess fatal cancers per person-rem provided by BEIR-V and found in section N.1, footnote 1, p. N-2, it is clear that there is an 88% chance that one of the transportation crew will develop a fatal cancer.

Using the risk factor of 3.77x10^-3 excess fatal cancers per person-rem provided by Gofman (1981, p. 314), it is clear that at least 4 (actually 4.15) of the 30 people comprising the transportation crew will develop a fatal cancer as a result of their employment.

By the same calculations, with data from tables D.3.10 and D.3.12, BEIR-V predicts a 39% chance that a non-occupational person will develop a fatal cancer and Gofman predicts that almost 2 (1.84) people will develop a fatal cancer.

Table D.3.14, p. D-58

Why are there no totals for the crew member exposures listed in the columns, "In-transit", "Stops", and "Total". From the title of this table, I assume that the maximum exposure to an individual crew member is the sum of the column labeled "Total". For both CH and RH TRU waste, I calculate 632.3 rem, which gives a 50% chance of developing a fatal cancer using BEIR-V data and a 100% chance of developing a fatal cancer using Gofman's (1981, p. 314) data.

Table D.3.14, p. D-58

From table D.3.14 I tabulate that the total maximum exposure to a crew member is 632.3 rem. Given 30 crew members (p. M-16) this gives a maximum exposure to the transportation occupational population of 18,969 person-rem. Why is this value different from that obtained by adding the exposure values from tables D.3.11 and D.3.13 which gives 1880 person-rem. There is a factor of 10 difference between these two values.

Sec. D.3.2.2, p. D-61

The DOE states that, "Hypothetical lifetime maximum crew member exposures are projected to be up to 130 rem for CH TRU waste shipments and up to 180 rem for RH TRU waste shipments. Does this mean that separate crews will ship solely CH or RH TRU waste? Or does it mean that the hypothetical lifetime maximum exposure is really 310 rem?

Sec. D.3.2.2, p. D-61

The DOE states that any crew member who receives an accumulated dose of 5 rem in any given year will be reassigned to duties involving no further exposure. Does this mean that they will resume working in exposure situations the next year? Also, 25 years of 5 rem/year is 125 rem. Using the BEIR-V risk factor of 8.0x10^-4 excess fatal cancers per person-rem, I calculate a 10% risk that this exposure will result in a fatal cancer. If each of the 30 drivers receives this exposure, then 3 drivers will die of a lethal cancer as a result of their work.

Using Gofman's (1981, p. 285) risk factors, which are age dependent, and assuming 5 rem/year for 25 years beginning at age 25, there is a 31% chance that this exposure will result in a fatal cancer. If each of the 30 drivers receives this exposure, then 10 will die of cancer over and above any natural incidences of cancer in the group.

I assume that the DOE is not responsible for setting the regulatory limit for occupational exposures, but it is responsible for providing for the safety of its staff and the public. Since material used in the SEIS (BEIR-V, specifically) indicates that even the occupational exposure limit is not safe for the time period required for the proposed plan, how does the DOE plan to insure the safety of its staff?

### SEC. B.2.4.3, P. B-19

In section B.2.4.3 the DOE states that the total inventory of CH TRU waste was modified to account for the decay of short-lived nuclides and the buildup of daughter products with high radiotoxicity. What constitutes a "short lived" radionuclide? What constitutes high and low radiotoxicity?

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ENVIRONMENTAL DEFENSE FUND

1405 Arapahoe Avenue
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(303) 440-4901

June 14, 1990

Senator Jeffrey Bingaman
524 Senate Hart Office Building
Washington, D.C. 20510-3102

RE: RCRA and WIPP

Dear Senator Bingaman,

At the April 26 hearing, Senator McClure asked a question which suggested that he has been led to believe that if Congress does not prohibit the Resource Conservation and Recovery Act (RCRA) from applying to the Waste Isolation Pilot Plant (WIPP) that New Mexico could use its authority under RCRA to veto emplacement of transuranic wastes at WIPP. Senator McClure's concern in this regard is unfounded because his underlying premise is not legally supportable.

RCRA and the regulations adopted thereunder by the Environmental Protection Agency establish certain requirements for facilities in which are disposed hazardous materials. States with the authority to enforce RCRA must adopt consistent versions of the law and regulations prior to gaining this power. Inherent in our rule of law is that no State can ignore its own statutes and rules. Thus, if DOE can demonstrate that WIPP complies with New Mexico's RCRA-derived hazardous waste law and pendant regulations, New Mexico cannot deny DOE a permit for operations at WIPP. To do so would put New Mexico in clear violation of the Administrative Procedures Act which bars an agency from ignoring its regulations or applying them in an arbitrary and capricious manner. DOE would have an easy court case.

For this reason, RCRA application to the WIPP does not represent the barrier that Senator McClure may have thought and the Congress should not remove WIPP from the universe of facilities to which its protections apply.

Thank you for your consideration of this matter. Please include this letter in the record of the hearing.

Sincerely,

Melinda Kassen

Melinda Kassen, Senior Attorney

cc: Senator McClure

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Senator **Bingaman**. Let me ask either or both of you a couple of questions if I could.

Some of the testimony of the panel earlier was that the EPA standards that WIPP is being required to comply with really are not appropriate or were not designed for this type of facility or this type of waste, as I understood the testimony. And one example that was given was a requirement that all containers coming to the site be opened.

I would be interested in knowing if—first, on the general question of whether the EPA standards that we are talking about here are appropriate for this type of site, any additional comments you would have on that, and then secondly, if you have any knowledge on this particular requirement. It does strike me, just as a matter of common sense, that it does seem to be a little counterproductive, to be opening these containers at the site.

Mr. **Hancock**. I think, Senator, there may be a couple of issues there. One is regarding the EPA standards, the disposal standards, they do apply to WIPP. They do apply to transuranic waste facilities. On the face of them, they were designed, they were published for a Federal Register comment, related to that.

So yes, certainly my organization and others made a lot of comments on the disposal standards along the way, related to WIPP. Some of those were responded to by EPA and some of them were not.

I think, Senator, your question really goes to the statement that was made regarding RCRA, the RCRA standards as opposed to the EPA disposal standards, which the comment was made about opening the drums.

I would agree with the statement that was made by the Blue Ribbon Panel that RCRA standards were not specifically designed with WIPP in mind. They were designed with hazardous waste facilities generally in mind.

Frankly, that is as it should be, though. We should be developing environmental and health and safety standards that apply across the board. There are literally thousands of RCRA facilities in this country, facilities that handle—store hazardous waste. WIPP is unique in the sense of dealing with some of the mixed waste that we are talking about.

In terms of your specific concern, are there provisions of RCRA that need to be looked at in terms of WIPP, I would certainly agree that that can be done. That would be part of the Part B permitting process that the State of New Mexico would be involved in.

I would not, and I do not think this was necessarily the implication by the panel, I would certainly not agree that the land ban provisions of RCRA, the provisions that require treatment of waste, of certain wastes before they are put into landfills or disposal sites, are not applicable to WIPP. And those are the provisions that we are talking about right now in terms of the no migration variance that is being considered and that we will be looking at—we are looking at it now and citizens of New Mexico and other people will have a chance to comment on it.

I hope that is clear. I think there are two different issues, and I do not want to——

Senator **Bingaman**. Let me restate the one piece of it. It was not a question of whether they were applicable, but I guess the specific which I recall, and maybe it was in RCRA regulations that we are talking about, was the requirement that you open these containers when they get them to the site.

Now, to your knowledge, is that a requirement that is in there? If so, does that make sense?

Mr. **Hancock**. Well, I do not want to comment on the specific provision. Let me comment on the function. The function is that RCRA was intended to know what is in particular containers.

Unfortunately, the Department of Energy says that they can certify what is in each of these containers, and they can do it at the generating site so that they would not need to be opened at WIPP.

What we know, however, is that there is great concern about whether we in fact do know what is in each of those containers, hence, members of the panel talking about the need to have better characterization of the waste, the need to treat the waste, because we do not know what is in each of those drums.

I think as a practical matter we need to know what is in the drums. If the only way we can know what is in the drums is to open them once we get to WIPP, then we would need to do that.

I would agree that that is not the best way to do it. We need to know what is in the drums when they are at the existing site. I do not believe that that is an issue that is irresolvable in terms of RCRA permitting.

I would remind you that those wastes, for example, at Rocky Flats need to operate under RCRA permits at Rocky Flats, just as most of the other facilities, those wastes need to be under RCRA permits at the site. So I think that specific issue that has been raised can be resolved.

Senator **Bingaman**. One of the suggestions which has not quite been made as a suggestion but has been raised as an issue very strongly by the panel and by Mr. Neill both was the issue of whether this waste needs to be treated or modified before it should be put in on a permanent basis.

Do you believe it should be treated or modified, and if so, in what way? Either one of you.

Mr. **Hancock**. I think I indicated in my testimony that it seems to me that that is a pretty inescapable conclusion at this point. That is one of the two alternatives that DOE—the two reasonable alternatives that DOE could take. They either need to abandon the project because it does not comply or they need to fix it or try to fix it so that it will comply.

I think both engineered barriers and treatment of the waste is going to be necessary.

I would also mention that treatment is a general problem for transuranic waste. As Michele mentioned in her testimony, the large majority of transuranic waste in this country is currently not scheduled to come to WIPP, and I think we do need to look at treatment, both of stored waste and the other transuranic waste.

Somehow we need to get some control back over wastes that have leaked. But in terms of specifically wastes that are stored, yes, I think they are going to need to be treated.

In answer to do we know what kind of treatment is going to be needed, as Mr. Neill just indicated, there are a range of treatment alternatives. We and others have argued that we need to be looking at those. DOE needs to develop better information on them.

So in terms of the specific treatment, Mr. Chairman, I do not think we know that yet. But, yes, the decision could already be made by DOE it seems to me that they need to treat the waste.

Senator BINGAMAN. In your view, if they proceeded to build the necessary engineering barriers and to make the necessary modification or treatment of the waste, can the WIPP site be made safe?

Mr. HANCOCK. I think right now the evidence would be that that is still highly in doubt. We will not know until two things happen. We will not know until they determine how they are going to do—what specific engineered barriers they are going to do and how they are going to treat the waste. And we will not know until we see, therefore, what analysis that comes out with in terms of compliance with new repromulgated EPA standards.

That is the standard. The only way to determine the safety of WIPP is to measure it with independently arrived at, legally applicable standards. That is what those EPA disposal standards are about. That is why in my testimony today and at other times we have emphasized that a lot, and lots of citizens in New Mexico and other places have emphasized that as a very important issue.

Senator BINGAMAN. But is there anything about the site that you are aware of today which would prevent the waste from being safely stored there if proper engineering barriers are constructed and if proper treatment of the waste is accomplished?

Mr. HANCOCK. Well, I want Michele to have a chance to respond to that one, too, Senator. I think, as I said, I think there are serious doubts about that. One of the issues, one of the requirements of that EPA Subpart B are what are called the assurance requirements.

We have talked about the performance assessment part of those requirements. We have not talked about the assurance requirements.

As a practical matter, it has been generally agreed for decades that you should not site nuclear waste repositories in places with natural resources that present or future generations are going to want to exploit because you set up a situation where you are going to have a direct conflict between health hazards of the waste underground escaping and the need to use the mineral resources.

When the WIPP site was originally sited, it was assumed that potash and natural gas resources were not there. We now know that that was wrong. So that particular kind of thing is always going to be a problem, so we are going to have to be able to show that we have good enough waste form, good enough engineered barriers to prevent—so that even in a human intrusion situation we will not have severe releases of radioactivity.

That is going to be tough. We will have to see what DOE can come up with. So far they have not given us any engineered barriers, and they have not determined what the treatment would be.

Senator BINGAMAN. How do you respond to the point which was made by an earlier witness that you need to measure the risk of potential safety problems in the next 10,000 years, against the risk of leaving of the waste where it is?

Ms. **MEROLA**. I think that is a very selfish viewpoint because what you are essentially doing is foisting our problems off on to future generations, if I understand the point correctly.

Senator **BINGAMAN**. But presumably, if you left the waste where it is, future generations have the problem in the future, just like if you put it at WIPP, future generations have the problem in the future. And I guess what I am saying is, if you are not selfish and if you are just looking to future generations, how do we best serve them? Do we best serve them by putting in this type of facility or by leaving it where it is?

Ms. **MEROLA**. I think we could best serve future generations by recognizing the problems that have come up with the WIPP site over the last 10 years, rather than refusing to acknowledge that there have been a lot of changes that signify that in fact this site is not a suitable repository and we do need to find a reasonable, safe, viable solution to dealing with our nuclear waste.

But we are not doing that right now. We have been focused solely on WIPP and have not really explored alternatives fully, and that is what we need to start doing at this time.

As I mention in my testimony, in fact, WIPP is only going to handle, if it were to open, one-fifth of the existing transuranic waste. Now that does not include low level waste or high level waste. So if we are looking for a solution to our problems, this is not going to set any kind of standard and give us any kind of a long-term solution.

Senator **BINGAMAN**. Let me just ask one more question to Michele. Do I take it, you are persuaded that the WIPP site it not a proper repository for waste, and efforts to further demonstrate it or treat waste or build engineering barriers, none of that is going to fix the basis problem, which is that this is not a good site. Is that right?

Ms. **MEROLA**. I know as it stands now, I know that it is not a good site and that it cannot in fact comply with EPA's standards. We need to——

Senator **BINGAMAN**. When you say, as it stands now, is there something that can be done to change that in your view?

Ms. **MEROLA**. It is possible, but we do not know yet. We need to look at some kind of engineering modifications. We do not have—the seals at the site are going to be very, very important in terms of containing the radioactivity, but those have not been designed yet.

We do not know how those will function. I think that actually waste treatment is inescapable. We are going to have to treat the waste somehow. The evidence shows that clearly so far. So if we were to go ahead with the test plan as it presently stands, it would be really a tremendous waste of time and money because we are going to have to treat the waste somewhere down the line if WIPP were in fact ever to work.

Senator **BINGAMAN**. Don, did you want to add something?

Mr. **HANCOCK**. Yes, if I can just respond, if I can, Mr. Chairman, a little bit on this risk balancing issue. I think it is an extremely important one.

I guess there are a couple of things that I would try to add to the discussion that we have had today, though. I think it is hard for anybody to believe that when we move wastes around, whether to WIPP or anyplace else, we are not increasing the short-term risks to the public.

When we transport the waste from anyplace to someplace else, we are exposing millions of people who otherwise would not have the potential exposure from transportation and transportation accidents.

So that one needs to be kept in mind, too. I think one——

Senator **Bingaman**. Let me just ask. Taking the point that Michele made earlier, that is a risk that the present generation has to—if we determine to move this waste to WIPP, the present generation will incur the risk of the movement in order presumably to ensure that future generations will not incur as much risk from this waste as they otherwise would.

Mr. **Hancock**. That is precisely why we have argued that if you are going to move it, you need to make as sure as you can that the transportation is as safe as possible. And we have laid out a series of things that needed to be done, and as I said in my testimony, those still have not been done.

On the issue of sites, however, the question is what is the term we are talking about. I think that I would agree—DOE says in their environmental impact statement that the waste is perfectly safe where it is for decades to 100 years.

I think that potentially is probably the case for the stored wastes. The wastes that are already leaking, I would say there needs to be something done with them much faster than that.

Therefore, again, we go back to this question of what is the rush? Are we rushing into increasing the risk to the present generations from transportation unnecessarily, and are we going to put the waste in a place where we are going to lose control of it?

If we know that the transportation is as safe as it can be and that the site is going to meet standards, then perhaps that is the reason you take that risk. You say, we are going to have a short-term risk but long term we are going to have a better solution.

We are not at that point yet, Senator. We have not shown that this site is going to work long term. As I say, the available information, even from DOE, is the site does not work, and it is not going to work for a number of years at a minimum. So what is the rush to both (a) declare it is a solution, and (b) to give a permanent land withdrawal to turn the site in perpetuity over to the Department of Energy, and (c) to have those kinds of risks?

I think that that is not the proper way of balancing the risks. I think those future generations are important, and what we want to do—one thing I said in my written testimony that I did not mention—I think we better think about what kind of standards those future generations are going to want and I think it is real likely that those future generations are going to want a zero-release standard.

Senator **Bingaman**. I guess it comes down to something of a tradeoff in the sense that you look at what you think the risk is of the waste remaining where it is, and you compare that to what you think the risk would be of putting the waste in the site, given what we know at this time about the site and all, and have to make a judgment as to which of those—and your judgment is that the risk of leaving it where it is is not sufficiently great to justify moving it?

Mr. HANCOCK. Let me add something to that. I do not think it is just up to, let us take a poll and see what peoples' individual judgments are. That is why we have environmental protection standards. Those are the criteria.

The existing sites need to be safe. They need to comply with RCRA for example at those sites. Any new site, WIPP in this case, needs to comply with all of those requirements, so that we have the maximum amount of safety that we can. And it is not just judgment. That is why we have laws; that is why we have regulations.

We have not asking for anything extraordinary for anybody maybe but the Department of Energy——

Senator BINGAMAN. No, but the laws and regulations, all they are is a written-down attempt to make explicit policy based on an assessment of risk.

Mr. HANCOCK. They are also a means by which the public and the scientists can use those judgments in a way to say how much risk there is and how safe it is. And that is why I say—I am sure it was not your intention—but no, I do not think I am the one to be put up to judge whether a site is safe or not.

That is why we argue that there are standards that need to be met, and we have argued that for more than a decade and if WIPP would have met those standards, it would have moved along. It has not met those standards and so it has not moved along.

Ms. MEROLA. Mr. Chairman, if I may address your original question.

Senator BINGAMAN. Yes, go right ahead.

Ms. MEROLA. The environmental impact statement states that if proper institutional controls were implemented at the sites, that if we were to leave the waste there, that the adverse impacts would be minimal. So if you are looking at the long term, at what we know about the site now in that it cannot be safe, I think that—let go back for one second because this plan of action, leaving the waste on site is dismissed because it is concluded that it would be imprudent and unfair to impose long-term institutional controls on future generations without their consent.

But when we know now that the site is practically guaranteed to leak, I think it is even more imprudent and unfair to irreversibly contaminate the environment of future generations without their consent.

Senator BINGAMAN. And you are saying that the WIPP site—we do know that the WIPP site is almost guaranteed to leak. That was your statement?

Ms. MEROLA. As it presently stands. The scientists review panel, when they analyzed WIPP as a wet repository, once it was found that there is a significant amount of brine seepage into the site, stated quite clearly that it cannot meet EPA standards because a certain amount of radioactivity will migrate off site. Lokesh Chaturvedi of the Environmental Evaluation Group concurred with that evaluation.

In the current version of the environmental impact statement it states that a seal failure at the site would result in radionuclides migrating to the Ogallala aquifer, and those seals again, which are so critical, have yet to be designed.

Senator BINGAMAN. Okay, we undoubtedly will call on both of you for more opinion as this issue continues to be debated.

Thank you all very much. I think it has been a useful hearing, and we will adjourn the hearing.

[Whereupon, at 4:50 p.m., the hearing was adjourned.]

# APPENDIXES

## APPENDIX I

## Responses to Questions From April 3, 1990, Hearing

## POST-HEARING QUESTIONS AND ANSWERS

MANUEL LUJAN, JR.
SECRETARY
UNITED STATES DEPARTMENT OF THE INTERIOR

APRIL 3, 1990

Supplemental Q's and A's from hearing on WIPP
before Senate Energy Committee

Q1. In 1989, the Department of the Interior participated in the Administration's interagency clearance process on the Department of Energy's proposed WIPP land withdrawal legislation. At that time, Interior did not clear the proposed legislation.

Qa. What were Interior's concerns about the proposed legislation?

A. The comments provided during the interagency clearing process are provided in confidence and therefore we are not in a position to disclose them.

Qb. How is the current Administration bill different as a result of the views you expressed at that time?

A. See answer to Qa.

Qc. What additional provisions did the Bureau of Land Management believe should be part of the Administration's proposal?

A. See answer to Qa.

Qd. Do you now support the Administration's legislation?

A. Yes.

Q2. Since an administrative land withdrawal can be for as long as 20 years, why wouldn't it be appropriate to withdraw the land administratively for the test and demonstration phase at WIPP?

A. The withdrawal concept in the Federal Land Policy and Management Act (FLPMA) envisions that the lands withdrawn, to a large extent, be suitable for return to their former status and public land uses at the conclusion of the withdrawal.

BLM is a land management agency, not an agency whose responsibility is management of hazardous wastes. Management of WIPP lands if they were to be returned to BLM would be foreign to it and would force BLM to duplicate responsibilities currently under the aegis of DOE. This would be expensive and counterproductive. For these reasons we believe a permanent legislative withdrawal and transfer of jurisdiction over the lands to DOE is the most appropriate method of handling WIPP's test and demonstration phase.

We will continue to work with DOE and the Congress to ensure passage of the Administration's proposal that will permanently transfer lands needed for the WIPP Project to the jurisdiction of DOE.

# ANSWERS TO POST-HEARING QUESTIONS
# RELATING TO THE
# APRIL 3, 1990, HEARING
# BEFORE THE
# COMMITTEE ON ENERGY AND NATURAL RESOURCES
# U.S. SENATE

WITNESS: ADMIRAL JAMES D. WATKINS, U.S. NAVY (RETIRED)
SECRETARY OF ENERGY

## QUESTIONS FROM SENATOR JOHNSTON

| | |
|---|---|
| Question 1: | Please review for the Committee the various agreements DOE has made with the States in which TRU waste is generated or stored. When is the most likely time under these agreements that TRU waste will have to be moved? What are the key assumptions in this estimate? How firm are these assumptions? |
| Answer: | Various agreements exist between DOE and States that have DOE facilities which generate or store TRU waste. These include RCRA permits or interim status, Agreements-in-Principle, and Federal Facility Compliance Agreements. The following is a list of States with DOE sites that generate or store TRU waste and the status of agreements or RCRA permits (or interim status) that deal with TRU waste: |

| | |
|---|---|
| Washington | Federal Facility Compliance Agreement and Consent Order (Tri-Party Agreement) |
| Colorado | RCRA - Part A, Federal Facility Compliance Agreement (FFCA) |
| South Carolina | RCRA - Part A, Negotiating a FFCA |
| Idaho | Agreement-in-Principle, Compliance Order and Consent Agreement, Negotiating a FFCA |
| Nevada | No agreement regarding TRU waste |
| New Mexico | RCRA mixed waste authority effective July 25, 1990. Consultation and cooperation agreement between State of New Mexico and DOE. |
| Tennessee | RCRA Permit |
| California | No agreement regarding TRU waste |
| Illinois | No agreement regarding TRU waste |
| Ohio | No agreement regarding TRU waste |

Answer 1
(continued):

These agreements do not address a firm volume capacity limit, with the exception of the Rocky Flats Plant (RFP) in Colorado. The Colorado agreement specifies a 1601 cubic yard limit for mixed-TRU waste and Governor Romer has indicated that this limit will not be increased. The RFP situation is explained in more detail in Answer 2. Other State agreements are not as specific on volume limits and/or storage capacity limits which are expandable by up to 50%, under RCRA. Although each site may have a specific installed capacity limit, this capacity can be increased through normal facility expansion or construction consistent with normal safety assessments.

Prepared By: Steve Cowan
Phone: 353-3956
Date: July 25, 1990
Coordinated with: DOE sites at Hanford, SRS, NTS, AL, LANL, ORO, RFO, ID
Reviewed By:

QUESTIONS FROM SENATOR JOHNSTON

| | |
|---|---|
| Question 2: | Please review for the Committee the status of your plans for interim storage of TRU waste should WIPP not be ready to open by this time. Does DOE have statutory authority to carry out these plans if necessary? What is the status of your discussions with potential host States of these plans? |
| Answer: | As previously stated, the Rocky Flats Plant (RFP) has a 1601 cubic yard limit for mixed TRU waste. The staff at RFP have been working aggressively to reduce the generation of mixed-TRU waste. Depending on resumption of production activities at RFP, the 1601 cubic yard capacity limit would be reached by early 1991, without the use of a supercompactor. With the supercompactor projected to begin operation in the first quarter of calendar year 1991, the capacity limit is not expected to be exceeded before early to mid 1992. If WIPP begins accepting RFP mixed-TRU waste for the bin and alcove testing by mid 1991, and depending on the quantity of test waste coming from RFP, the limit at RFP would not be reached for up to an additional couple of years. |

To prepare for alternatives to WIPP or failure of the supercompactor to come on-line in early 1991, the Department is proceeding with three parallel paths for alternative storage of the RFP mixed-TRU waste. The nearest term path is the DOE sites interim storage option, which is the only option DOE believes can be implemented in the near term. The second path is the privatization effort whereby a private company would store this waste on its property and

Answer 2 (continued): receive a fee from DOE. The third path is the potential storage of this waste on property controlled by the Department of Defense (DOD). Both of the last two alternatives will require a RCRA permit before construction begins and potentially could be implemented by late 1993, although the range of estimates extends from late 1992 to late 1995.

The DOE interim sites alternative is being pursued for possible implementation in the near term, in the event that the RFP supercompactor does not operate as planned. All of the eight DOE sites (Hanford, Rocky Flats Plant, Savannah River Site, Idaho National Engineering Laboratory, Oak Ridge National Laboratory, Waste Isolation Pilot Plant, Los Alamos National Laboratory, and the Nevada Test Site) have prepared action plans for accepting a portion of the waste. Above ground storage at the WIPP site will require legislation or administrative authority. The sites have been directed to proceed with nonconstruction critical path activities necessary to maintain their readiness schedules. A major institutional element of these plans is the preparation of permit applications or permit modifications required by the Resource Conservation and Recovery Act (RCRA) that would need to be approved by the respective State agencies or the

Answer 2 (continued):

Environmental Protection Agency (EPA). Activities on the longer term alternatives of privatization and the DOD sites are proceeding in accordance with plans developed in late 1989. A Commerce Business Daily announcement was published on February 23, 1990, indicating DOE's intent to issue a Request for Proposals, presently expected to be issued this summer. A DOE/DOD working group is presently screening major military installations as possible contingency storage sites.

There are two statutory requirements which must be completed before DOE can transfer waste from RFP to other DOE sites for temporary storage. First, National Environmental Policy Act documentation must be completed. A draft environmental assessment (EA) for this activity has been prepared and is undergoing internal DOE review. The Department's intent is to issue an EA and a draft Finding of No Significant Impact (FONSI) for public review. If subsequently a FONSI is issued based on the EA, then this requirement will be complete. Second, since this waste contains hazardous chemical constituents, it comes under the regulatory authority of RCRA. In most cases, the States have been given authority by EPA to regulate mixed-TRU waste. DOE intends to submit RCRA Part A/B modifications to the respective State agencies approximately three months

Answer 2 (continued): before the needed date. This is expected to be sufficient lead time for all sites with interim status. Tennessee is the only State with an approved permit, and the process is expected to take longer in that case. Once those Part A/B modifications are accepted, then this requirement will be complete. Although the extent of review required depends on the State, DOE anticipates that the States will accept these modifications. In addition, land disposal restriction storage prohibitions may require development or modification of a compliance agreement between DOE and EPA specific to the receiving site. The government of the United States has the option of requesting a presidential exemption to RCRA if there is a overriding national interest.

Meetings were held on November 17, 1989, February 22, 1990 and on May 24, 1990, with representatives of the Governors of the seven potential storage site States. No States have yet been asked to accept RFP waste, beyond that already stored at Idaho. Discussions are continuing with the seven States to maintain open communications and to share recent

Answer 2 (continued): developments. The Department anticipates that continuing evidence of significant progress toward a permanent solution will encourage further cooperation from the States.

Prepared By: Steve Cowan
Phone: 353-3956
Date: July 25, 1990
Coordinated with: Lou Willett, DP-23
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

**Question 3:** Please give us your best estimate of when WIPP will be ready to open. Will it be in 1990?

**Answer:** In June 1990, I announced that the earliest WIPP could begin receiving waste for the Test Phase would be January 1991. Several milestones remain to be completed; however, I will not compromise health or safety concerns to meet any schedule. For example, EPA must still make a decision on whether to grant DOE a conditional No-Migration Variance for WIPP before WIPP could accept TRU mixed waste.

Prepared By: Mark Frei MW7
Phone: 427-1613
Date: July 25, 1990
Coordinated with:
Reviewed By:

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## QUESTIONS FROM SENATOR JOHNSTON

Question 4: At the April 3 hearing, Senator Domenici asked the EPA witnesses a series of questions related to EPA's recommendations to DOE concerning the test plan. In particular, Senator Domenici noted a number of studies that EPA recommended DOE complete. The items identified by Senator Domenici included (a) systematic assessment of WIPP long-term performance; (b) information demonstrating compliance with subpart A; (c) report on waste technologies and engineering improvements; (d) waste recovery experiment with simulated waste; and (e) a summary of models describing how gas generation may affect the performance of WIPP. What is the status of these items? Has DOE followed these recommendations? When will the Department provide to EPA any of these items that DOE has committed to provide?

Answer: Items (a), (c), (d), and (e) were contained in comments by the Environmental Protection Agency (EPA) on the April 1989 and December 1989 drafts of the Plan for the Waste Isolation Pilot Plant (WIPP) Test Phase. The status of each follows.

(a) Systematic assessment of WIPP long-term performance. DOE agrees with this recommendation and has performed and documented a number of analyses contributing to such an assessment. Two of these analyses[1] have been discussed with EPA staff and were provided to EPA for its review. A report published by Sandia National Laboratories in June, provides the current status of projected long-term environmental performance of WIPP.

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[1] SAND 88-1452, "Draft Forecast of the Final Report for the Comparison to 40 CFR Part 191, Subpart B for the WIPP," and SAND 89-2027, "Performance Assessment Methodology Compliance with EPA 40 CFR 191, Subpart B, for the WIPP."

Answer 4
(continued):

(c) Report on waste technologies and engineering improvements. DOE has organized an Engineered Alternatives Task Force to study the feasibility and effectiveness of alternatives to the present waste forms and facility design as well as passive surface markers. The final Program Plan for the Task Force was issued in April and a draft report on Recommonded Initial Waste Forms For The WIPP Experimental Test Program was issued in May. A final report on recommended waste forms and repository design is expected in early 1991. EPA and other external groups receive the reports and are briefed periodically on the results of the study.

(d) Waste recovery experiment with simulated waste. DOE will evaluate the feasibility of two full-scale, instrumented, backfilled, sealed pilot waste disposal rooms as recommended by EPA. This evaluation also will address the recoverability of the emplaced waste and is expected to be completed in mid-1991. It will be available for external review before a decision will be made on whether to proceed with the pilot rooms.

(e) Summary of models describing how gas generation may affect the performance of WIPP. DOE concurs with this

**Answer 4 (continued):**

recommendation and has discussed its implementation with EPA staff. The gas generation models will be provided to EPA this fall.

Information on compliance with Subpart A (item (b)) has not been requested by EPA. However, analyses of WIPP's ability to comply with 40 CFR 191, Subpart A, "Environmental Standards For Management and Storage," during routine operations are documented in the WIPP Final Safety Analysis Report (FSAR). Specifically, Section 6.1.6.3, "Dose Calculation Parameters and Discussion Of Results," and Section 6.1.6.4, "Effluent and Environmental Monitoring and Exposure Pathways," discuss the prediction that WIPP will be operated in compliance with the standard. In addition, this information is summarized in Section 1A.2.4.2, "Off-Site Doses." Analyses to be performed in preparation of the addendum to the FSAR will evaluate the potential impact of the Test Phase activities on compliance with Subpart A. Although not required by the regulations, these portions of the FSAR and the addendum are provided to EPA for informational purposes when they are approved. With regard to reporting of compliance results to the EPA, it should be noted that Subpart A does not require such reporting. DOE as the implementing agency will monitor

Answer 4
(continued): to verify that the annual dose limits have not been exceeded. The results of the WIPP Monitoring Program will be reported in the "Annual Site Environmental Report" and provided to the State of New Mexico, the EPA and the Environmental Evaluation Group.

Prepared by: Mark Frei
Phone: 427-1613
Date: June 19, 1990
Coordinated with: Vernon Daub
Reviewed by:

## QUESTIONS FROM SENATOR JOHNSTON

Questions 5: In October 1989, EPA recommended that DOE look at the feasibility of loading two pilot-scale rooms with waste in addition to the tests already planned at WIPP. EPA stated at that time its view that the loading, backfilling, and sealing of these rooms could be done during or immediately after the test phase. EPA estimated that approximately 1.5% waste would be required for these two rooms. Has the Department evaluated this recommendation? At the April 3 hearing, Senator Bingaman asked the EPA witnesses if there was any reason Congress should authorize DOE to conduct this testing prior to the time that compliance with the EPA standards had been demonstrated. In the Department's view, are there reasons to authorize initiation of this additional testing -- if it proves feasible and appropriate -- during the 5-year demonstration period, prior to demonstration of compliance with subpart B standards?

Answer: The pilot rooms proposed by EPA appear to be a worthwhile concept and DOE will initiate a feasibility study in the near future. Such a study, however, will require the analysis of several complex technical issues and it will be some time before the necessary data are available. For example, the potential monitoring capability in a sealed room is uncertain and procedures for recovering waste from a sealed room several years after closure need to be determined. In addition, the results of the on-going evaluation of potential engineering modifications are needed.

EPA has indicated that the pilot rooms could have two objectives. The primary purpose is "...to provide the foundation for long-term monitoring of expected repository performance throughout any operational lifetime at WIPP."

**Answer 5 (continued):**

If pilot-scale rooms are initiated during the Test Phase, the secondary objective would be "...to obtain full-scale validation of expected performance of the WIPP". The EPA believes that two conditions should be met before the pilot rooms are initiated, however:

(1) A decision is needed on potential engineering modifications to the current reference design for the repository system and any changes incorporated into the pilot room design; and

(2) Results of the continuing series of interim performance assessments should indicate that the repository has a reasonable expectation of complying with applicable standards.

In addition, the results of the feasibility study should determine through analysis that wastes could be recovered from a backfilled and sealed room even after many years of backfill consolidation.

It is possible, therefore, that the pilot rooms could be implemented prior to a final compliance determination. Depending on the results of the feasibility study, this would be a logical follow-up to the experimental program.

Answer 5
(continued):

Therefore, the Department believes it would be prudent not to preclude this possibility in land withdrawal legislation. It should be noted that changes to the current scope of the experimental program must be submitted to the EPA as a condition in its proposed granting of a no-migration variance. If there were a decision by DOE to proceed with the pilot rooms, this proposal would be subject to review and approval by EPA.

Prepared by: Mark Frei
Phone: 427-1613
Date: July 25, 1990
Coordinated with:
Reviewed by:

## QUESTIONS FROM SENATOR JOHNSTON

**Question 6:** The Department's test plan indicates that approximately 0.5% waste will be necessary for experiments and testing during the 5-year demonstration phase. Would it be appropriate for Congress to limit emplacement of waste to 0.5% during the demonstration phase? Wouldn't it be more appropriate to provide flexibility on the exact amount of waste that DOE would be authorized to put in WIPP?

**Answer:** Several reviewers, including the National Academy of Sciences WIPP Panel, have suggested to DOE that the results of the Test Phase not be prejudged by arbitrarily limiting the amount of waste or the length of the Test Phase. EPA also supported the need for flexibility in its Notice of Proposed Decision on DOE's No-Migration Petition by allowing DOE to emplace waste for the purpose of conducting tests and experiments related to long-term acceptability of the facility, without specifying a limit. Also in response to questions at the April 3, 1990, hearing, Mr. Clay, Assistant Administrator, Office of Solid Waste and Emergency Response, EPA, stated that for scientific reasons the tests might need to be modified and additional waste required. For this reason, DOE favors the flexibility allowed in the proposed legislation. Since the administrative withdrawal would be only temporary, and any waste emplaced during the Test Phase under an administrative withdrawal would have to be

Answer 6
(continued):

removed within the same period of time, no more waste could be emplaced than could be retrieved within the period of the administrative withdrawal.

## QUESTIONS FROM SENATOR JOHNSTON

| Question 7: | Have the transportation routes been identified and subjected to the required approvals? What is time frame for completing this? |
|---|---|
| Answer: | The Environmental Improvement Board (EIB) in the State of New Mexico is currently in the process of selecting alternative preferred routes. Draft designated routes have been identified and sent to interested citizens, analyses have been completed, and three public hearings have been held (April 9-10 in Santa Fe, April 12-13 in Albuquerque, and April 16-17 in Roswell). The EIB will consider all comments and currently expects to file the selected routes with the DOT on or before August 31, 1990. Under State law, the designated alternative routes will become effective 30 days later. However, under Federal regulations, the alternative routes are not effective until accepted by DOT. |

MWA for
Prepared By: Susan Denny
Phone: 427-1613
Date: July 25, 1990
Coordinated with: Joe Lippis
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

**Question 8:** I am concerned about excessive expenditure for new roads and road upgrades. I am concerned that this gives the impression that transportation of radioactive waste is so dangerous that these new roads are necessary.

a. What is your view of the need to construct bypass roads for cities that are on these transportation routes?

**Answer:** The DOE position is that the shipment of transuranic waste does not require special or new bypasses for the safe transportation of radioactive waste to WIPP. Nevertheless, DOE has agreed to provide information on proposed WIPP shipments in support of the State of New Mexico's request for funds to support highway infrastructure construction.

The schedule for shipments to WIPP has changed substantially since the DOE/State of New Mexico Agreement on funding for roads was signed in August 1987. That agreement was entered into with full-scale operations in mind. DOE now anticipates an initial Test Phase of approximately five years. Accordingly, the number of shipments during this early period will be significantly lower than originally anticipated.

**Answer 8a (continued):**

In addition, DOE has taken measures beyond its normal procedures to ensure safe and publicly acceptable transport of waste to WIPP, such as use of a Nuclear Regulatory Commission-certified packaging for waste containment.

MWJ, for
Prepared By: Susan Denny
Phone: 427-1613
Date: July 25, 1990
Coordinated with: Joe Lippis
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

**Question 8b:** Is there a proposal from the State for the construction of these bypasses?

**Answer:** In August 1987, DOE agreed to support the State in its efforts to obtain funding for new construction which had been proposed by the State. This list included the following requests: 1) A Hobbs Relief Route; 2) A Los Alamos/Sante Fe Relief Route; 3) a Roswell Relief Route; 4) a Sante Fe Bypass; 5) an Artesia Relief Route; and a Carlsbad bypass (Eddy County Loop Route). In February 1989, the Hobbs bypass was removed from the State Highway Department's list of projects.

MU7 for
Prepared By: Susan Denny
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Date: July 25, 1990
Coordinated with: Joe Lippis
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

**Question 8c:** Where would bypasses be built? How much money are we talking about?

**Answer:** See answer to Question 8b regarding location of bypasses. In 1987, a funding requirement of $190 million was identified.

MWA for
**Prepared By:** Susan Denny
**Phone:** 427-1613
**Date:** July 25, 1990
**Coordinated with:** Joe Lippis
**Reviewed By:**

## QUESTIONS FROM SENATOR JOHNSTON

**Question 8d:** What criteria should be used to determine if the money needed to build these bypasses should be spent?

**Answer:** No special provisions are required over and above standard highway engineering and design practices as adopted by the Department of Transportation, Federal Highway Administration, and the various individual State Highway Departments.

Prepared By: Susan Denny MWA, for
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Date: June 19, 1990
Coordinated with: Joe Lippis
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

Question 9: Wouldn't an operational demonstration of the WIPP TRU waste management system (as set forth in Section 6 of the Administration's bill) help ensure public confidence in the management of WIPP? Does the DOE plan such a demonstration? What steps must be taken before such a demonstration could be carried out? What actions are required of DOE? EPA? The State of Mexico?

Answer: The April 1989 draft of the WIPP Test Plan proposed a sizable Operations Demonstration in parallel with the conduct of experiments. Outside reviewers (National Academy of Science, New Mexico Environmental Evaluation Group, WIPP Blue Ribbon Panel, Advisory Committee for Nuclear Facility Safety) generally agreed with the concept of an Operations Demonstration. However, there was concern that the Operations Demonstration not interfere with the performance assessment experiments. There was also general concurrence among reviewers that significant quantities of waste should not be emplaced at WIPP until performance assessment can show a high degree of confidence that WIPP will comply with EPA disposal standards, and that Operations Demonstration wastes should be emplaced in the final repository configuration.

Consequently, DOE has determined that the Operations Demonstration will be conducted prior to a determination of compliance only if DOE has a high level of confidence that disposal will comply with EPA disposal standards and other

Answer 9 (continued): applicable regulations and if additional operational experience with waste is needed beyond that gained from the performance assessment experiments. This determination could occur three or four years after initiation of the Test Phase. Prior to a final decision on the scope of the Operations Demonstration, DOE must complete a feasibility study on the EPA-recommended pilot rooms, establish system objectives and criteria for repository operations and evaluate operational experience gained from the handling and emplacement of TRU waste for the Test Phase program relative to the objectives of the Operations Demonstration.

The EPA's proposed ruling on the No Migration Variance Petition specifically precludes DOE from conducting an Operations Demonstration. An amendment or revision to the No Migration Variance would be needed in order to conduct the Operations Demonstration. This would require DOE to submit a petition to EPA with sufficient documentation to warrant a modification to the variance. EPA would have to process this request for modification in a manner similar to the original petition and allow for public review of their proposed action. Since the administrative withdrawal would be only temporary, and any waste emplaced during the Test Phase under an administrative withdrawal would have to

Answer 9 (continued):

be removed within the same period of time, no more waste could be emplaced than could be retrieved within the period of the administrative withdrawal.

In the Second Modification to the Agreement for Consultation and Cooperation on WIPP between the State of New Mexico and DOE, it was agreed that compliance with the EPA disposal standards must be demonstrated prior to receiving more than 15% of the WIPP waste capacity. All proposed or conceptual experimental programs plus an Operations Demonstration could be accommodated within the 15% constraint.

## QUESTIONS FROM SENATOR JOHNSTON

**Question 10:** Section 7(c) of the Administration's bill requires the use of engineered and natural barriers to isolate the waste "to the extent necessary to comply with EPA standards for the disposal of the waste." In your view, under this language, who determines whether these barriers are "necessary" and how is the determination made?

**Answer:** DOE determines the need for these barriers based upon whether or not they are needed for compliance with EPA standards for long-term containment. The determination will be based upon sophisticated mathematical models which predict long-term performance with specified engineering designs. This determination will be documented in a full report. A draft of this report is expected to be completed in 1993 after extensive external review, including review by the EPA.

Prepared By: Kent Hunter, WPO
Phone: FTS 571-2127
Date: June 19, 1990
Coordinated with: Mark Frei
Reviewed By:

## QUESTIONS FROM SENATOR JOHNSTON

**QUESTION 11:** **Are you concerned that our experience with WIPP will be repeated with the repository under the Nuclear Waste Policy Act?**

**a. Will we need land withdrawal legislation? When?**

**b. Will we need a no-migration variance for the repository?**

**c. Will we need to require engineered barriers?**

Answer 11(a): If it is determined that Yucca Mountain is suitable for development as a repository, land withdrawal will be necessary and will be requested. It is likely that permanent legislative land withdrawal, which will require Congressional action, will be requested at the time the license application for construction of the repository is submitted to the Nuclear Regulatory Commission.

The Nuclear Regulatory Commission's review of the license application for construction of the repository will be based on the requirements in 10 CFR Part 60. The land ownership provisions of 10 CFR 60.121 requires that both the geologic repository operations area and the controlled area be located in and on lands that are either acquired lands under the jurisdiction and control of DOE, or lands permanently withdrawn and reserved for its use.

The Department has obtained Right-of-Way Reservations from the Bureau of Land Management for non-DOE lands at the Yucca Mountain Scientific Investigation site. In addition, we have applied for, and the Bureau of Land Management is currently processing, an administrative land withdrawal for a specific, more limited portion of the Yucca Mountain site. The administrative land withdrawal is being sought not for construction purposes but to fully protect from claims under the mining laws the area of land necessary for the planned scientific investigations. In this way the integrity of the area will be preserved.

The State of Nevada is actively opposing the administrative land withdrawal and has sued both the Department and the Bureau of Land Management with respect to the Right-of-Way Reservation. The case is scheduled to be heard in the U.S. Court of Appeals for the Ninth Circuit in August 1990.

Answer 11(b): The Department does not believe that a no-migration variance will be needed for the high-level waste (HLW) repository, but cannot be certain at this time.

Based on available information and preliminary analyses, DOE believes that HLW slurry exhibits a hazardous waste characteristic, as identified in the regulations implementing the Resource Conservation and Recovery Act (RCRA). All HLW will vitrified prior to emplacement in a HLW repository. Based on newly promulgated Environmental Protection Agency regulations, vitrification is the treatment standard for characteristic HLW. DOE will test the HLW glass resulting from the vitrification process for RCRA compliance. It is possible that some of the material contains some RCRA-listed wastes. If this is found to be the case, based on further analyses of HLW, DOE would consider applying for a treatability variance which would specify that vitrification is the appropriate treatment for the listed wastes.

In addition, some spent nuclear fuel (SNF) may exhibit a hazardous characteristic. A definitive determination cannot be made until further study is completed. We are currently developing plans to test SNF to determine if it does exhibit any of the hazardous characteristics and would therefore fall under the RCRA hazardous waste regulations.

Should DOE find that either the HLW or SNF waste forms that are proposed for emplacement in a repository includes RCRA-listed or RCRA characteristic waste, the repository would then be subject to RCRA regulation and would require a RCRA permit. In that eventuality, DOE would have several options. In addition to submitting a no-migration petition, DOE could consider formally requesting that the Environmental Protection Agency either delist those hazardous compounds or grant a no-migration or treatability variance.

Answer 11(c): Yes, engineered barriers, in addition to the natural features provided by the site, are required for the high-level waste repository. Use of engineered barriers in a repository whose natural features offer a high degree of containment implements the multiple barrier concept and increases confidence in the repository's ability to effectively isolate the waste. The Nuclear Waste Policy Act requires that Nuclear Regulatory Commission criteria and standards for repository design be based on a system of multiple barriers to prevent the release of radionuclides. In 10 CFR Part 60, the Nuclear Regulatory Commission requires that the repository system consist of both natural and engineered barriers and specifies criteria which each must satisfy. The engineered barrier system must be designed to provide substantially complete containment of waste within the waste package for a period of 300 to 1000 years, and to provide controlled, gradual release of radionuclides at a low rate thereafter. Compliance with these requirements will enhance the Commission's confidence that the applicable environmental standards promulgated by EPA (anticipated to limit releases of radioactivity to the accessible environment for at least 10,000 years) will be met. The Department's conceptual design for the repository, described in the Site Characterization Plan for Yucca Mountain, includes conceptual designs for an engineered barrier system appropriate for that site. These include a waste package consisting of the waste form, a container, and an air gap. Studies are planned by DOE to evaluate the desirability of additional or alternate barrier components.

Should these studies indicate that a longer life waste package could be developed, i.e., one that can provide substantially complete containment of the waste form for longer than 1000 years, confidence in the ability of the site to contain radionuclides for the 10,000 year period required by 10 CFR Part 60 would be enhanced.

## QUESTIONS FROM SENATOR DOMENICI

**Question 1:** Will the FSAR Addendum be approved, the Integrated System Checkout be completed, the interim status be accepted, and the transportation routes be designated before you make your decision on whether and when to open WIPP in June?

**Answer:** I recently announced that the earliest WIPP could begin receiving waste for the Test Phase is January 1991. I have not announced an opening date for WIPP, and I will not do so until the items you have mentioned are closer to being completed or have been completed.

Prepared By: Kent Hunter
Phone: FTS 571-2127
Date: April 17, 1990
Coordinated with: Mark Frei
Reviewed By: Jill Lytle

QUESTIONS FROM SENATOR DOMENICI

Question 2: Can WIPP open before these health and safety tasks are completed?

Answer: Of the specific items you have listed, the following must be completed before WIPP can receive waste for the Test Phase: the Integrated System Checkout and FSAR Addendum will be completed; in addition, DOE must receive interim status from the State of New Mexico for mixed waste to be used in the Test Phase. Also, certain of these items are required or expected through various agreements with the State of New Mexico.

With respect to transportation routes, while DOE can, under DOT regulations, ship to WIPP using the most direct interstate routes for which an alternate route is not designated by a State routing agency, DOE prefers to use alternate routes selected by the State of New Mexico routing agency and accepted by the DOT.

WIPP will not receive radioactive waste for experiments until I am personally satisfied that all health and safety requirements are completed and in place. In arriving at this decision, I will be relying on the independent oversight provided by several external review groups and panels.

Prepared By: Kent Hunter
Phone: FTS 571-2127
Date: July 25, 1990
Coordinated with: Mark Frei
Reviewed By: Jill Lytle

# POST-HEARING QUESTIONS AND ANSWERS

DON R. CLAY
ASSISTANT ADMINISTRATOR
OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

APRIL 3, 1990

QUESTIONS FOR THE RECORD

DON R. CLAY
ENVIRONMENTAL PROTECTION AGENCY

From Senator Johnston

1. You explain in your testimony why mixed waste at WIPP is subject to the land ban provisions of RCRA. If I understand correctly, the effect of the land ban restrictions is that the hazardous waste components of mixed waste must be treated using the Best Demonstrated Available Technology before it can be disposed of. The only alternative to this would be to receive a no-migration variance from EPA.

a. If EPA were to deny the no-migration variance, what could DOE do to treat its mixed waste so that it would be acceptable for disposal under RCRA?

b. Does the technology exist to treat this hazardous waste where it is mixed with radioactive waste? Is it readily available?

c. In the absence of readily available technology, what storage options would be available to DOE if EPA were to deny the no-migration variance?

d. Isn't it safer to dispose of mixed waste in a repository 2,000 feet below the surface than to continue to store this waste above ground pending retreatment of the hazardous components of this waste?

e. Isn't it true that there would be significant additional risks -- for example, in terms of occupational radiation exposures -- that would occur if we chose to pursue a policy of treating mixed waste prior to disposal?

2. I understand that the need for a no-migration variance from EPA is the presence of hazardous organic compounds and heavy metals with the TRU waste and that the organics are the main problem.

a. What options have been considered by DOE for treatment of the volatile organic hazardous waste component of the waste prior to disposal?

b. Doesn't this component comprise only 3 percent of the waste? (by weight?)

c. Couldn't the waste canisters be heated to drive off the volatile organics before the canisters go underground?

d. Then would we need a no-migration variance for the disposal phase of the operation of WIPP?

3. EPA's proposed ruling on the No-Migration Petition relates only to emplacement of waste for testing and experimentation. It would not, as I understand it, allow emplacement of waste for an operations demonstration. It would also not allow emplacement of waste for the pilot-scale rooms that EPA has recommended to DOE.

a. Since it was EPA that recommended to DOE the addition of two pilot-scale rooms for experimental and testing purposes, why didn't EPA include emplacement of waste for this purpose in its proposed ruling?

b. What would be required to extend this ruling to include emplacement of waste for the pilot-scale rooms? Would DOE be required tc submit an additional petition? Wouldn't the same issues be raised?

c. What new issues would be raised if DOE were to decide to conduct an operations demonstration?

4. The Department's test plan indicates that approximately 0.5% waste will be necessary for experiments and testing during the 5-year demonstration phase. Would it be appropriate for Congress to limit emplacement of waste to 0.5% during the demonstration phase? Wouldn't it be more appropriate to provide flexibility on the exact amount of waste that DOE would be authorized to put in WIPP?

5. I understand that "no" in "no migration" means no migration resulting in air or water concentrations at the disposal unit boundary that exceed EPA health standards. Thus the air exhausting form the top of the shaft cannot contain volatile organics (carbon tetrachloride, etc) in concentrations that exceed health standards. I also understand that this definition is being litigated by the Natural Resources Defense Council. Explain the litigation and the impact on WIPP if EPA should lose this litigation.

6. EPA's standards under Part 191 for disposal of radioactive waste were remanded by the U.S. Court of Appeals for the 1st Circuit in July 1987. At the time, as I understand it, the remand was on the narrow issue of reconciling the difference between the permissible levels of radiation in groundwater and those permitted under federal drinking water standards. As I understand it, the Court directed EPA to either reconcile the difference or explain why it was different. It has been almost three years since that remand. Why has it taken EPA so long to repromulgate these standards? Is EPA looking beyond the narrow issue that was remanded? If so, why?

7. You state in your testimony that the Subpart A standards for management and storage of waste would not be legally applicable to WIPP until it is designated as a disposal facility. I would assume, then, that the same would be true for the Subpart B standards. Why, then, would it make any sense to prohibit emplacement of waste in WIPP, as some have suggested, until compliance with these standards had been demonstrated?

8. Section 7(c) of the Administration's bill requires the use of engineered and natural barriers to isolate the waste "to the extent necessary to comply with Environmental Protection Agency standards for the disposal of the waste". In your view, under this language, who determines whether these barriers are "necessary" and how is the determination made?

## Response to Senator Johnston's Questions Raised in the April 6, 1990 Letter

1.a. DOE, through its Engineering Alternatives Task Force, is evaluating alternative waste forms which could reduce the gas generation rate or total gas generation potential for TRU and TRU-mixed wastes. These include stabilization, vitrification, incineration, compaction, and other technologies. Until this review is completed and more data become available, we will not know which of these technologies would achieve LDR standards. However, we believe that the treatment technologies that DOE is exploring would likely meet LDR standards or provide DOE with a basis to request a variance from the LDR standards.

b. In some cases, treatment technology exists and in fact is in use. For example, inorganic sludges at the Rocky Flats are currently stabilized with cement. In addition, it is our understanding that a supercompaction unit will soon be in place at the Rocky Flats Plant. In other cases -- for example, vitrification -- treatment capacity is not currently available. Through its Engineering Alternatives Task Force, and other activities, DOE is evaluating alternative waste forms and the feasibility of bringing them on line within a reasonable period of time. As stated above, we believe that many of these technologies are likely to meet LDR treatment standards. However, without further technical details on each, we cannot definitively say that a given technology may or may not meet LDR standards.

c. DOE would be required to find alternate storage capacity until appropriate treatment of disposal options are available. EPA believes that TRU mixed wastes can be safely stored at surface facilities if properly managed in appropriate containers.

d. EPA has not made a comparative analysis of the relative safety of disposing of mixed waste in the WIPP, versus continued storage on the surface. However, as EPA stated in its proposed no-migration variances for the WIPP, EPA believes that the repository is a promising site for permanent disposal and that the experimental phase at the WIPP should proceed as soon as regulatory requirements are satisfied. EPA does not believe that permanent disposal should begin at the WIPP until DOE has demonstrated compliance with long-term no-migration standards and with EPA's standards for the long-term disposal of radioactive waste.

e. EPA has not conducted a comparative analysis of the risks of waste treatment versus the disposal of untreated waste. For the most part, however, EPA believes that the hazardous components in mixed waste can be treated safely, although special safeguards may complicate the treatment processes and add to their expense. However, even special safeguards might not completely eliminate increased worker exposure to radiation during waste treatment. It is difficult at this time to weigh the relative risks of mixed waste pre-treatment until the long-term performance of the WIPP repository is better understood, and specific treatment technologies have been evaluated.

2.a. As discussed in the response to question 1a, DOE is currently evaluating alternative waste forms that could mitigate potential gas generation mechanisms and could also improve the ability of the altered waste forms to meet the LDR standards. These include, for example, stabilization in cement and vitrification (for sludges) and incineration (for contaminated combustibles). DOE indicates that the report of its Engineering Alternatives Task Force will be available by February, 1991.

b. The organic sludges (Waste Type IV) make up 3% of the total waste volume; the concentration of volatile organics in these sludges has been estimated by DOE to range from less than 1 part per million to greater than 10%. The other waste forms, such as the combustibles and the inorganic solid and sludges, also contain volatile organics; however, these waste forms contain relatively low levels of hazardous organic constituents.

c. Each waste canister (drum) is fitted with a specially designed carbon composite filter. This filter allows for the controlled low-level release of volatile organics while at the same time preventing the release of radionuclides. Since the filter is designed to regulate the minimal release of volatile organics, heating the drum would not permit a significant removal of volatiles from the waste container. Removal of the filter to allow greater release of volatiles by purging of the waste could increase the risk of exposure to radionuclides.

d. If DOE treated TRU mixed wastes to land disposal restriction standards, a variance for the disposal phase would not be necessary. DOE, however, would have to meet treatment standards both for the hazardous organics and for the characteristic wastes (i.e., the heavy metals).

3.a. EPA recommended that the feasibility of two pilot-scale rooms be evaluated by DOE and not that they be employed immediately. The DOE is beginning to look into this matter but did not include a proposal for room-scale tests in their no-migration petition. It would have been premature for EPA to grant a variance which would apply to a situation which may not be found feasible and for which neither data nor design was available.

If the pilot-scale rooms are found to be feasible, EPA has suggested that they could be started during or after the test phase. If the rooms were initiated during the test phase, DOE would have to request a modification to the no-migration petition, if a variance is granted for the test phase. Early data from these rooms might provide useful confirmation of smaller scale tests.

However, the primary purpose of these rooms would be to provide data on the performance of the WIPP over its operational lifetime of several decades. For this purpose it is not necessary that the pilot-scale room tests be initiated prior to a demonstration of compliance with EPA radiation disposal standards.

b. To extend the variance to the pilot-scale rooms during the test phase, DOE would be required to request a modification to the variance. This modification request would have to contain information that demonstrates there would be no migration from the pilot rooms and that waste could be retrieved. EPA would publish a proposed modification for public comment, before reaching a final decision. However, public comment would be limited to the terms of the modification; it would not extend to conditions of the variance that were already in effect if a final decision is made to grant the no-migration variance petition for the testing and experimental phase.

c. If DOE wished to conduct the operations demonstration during the test phase, a similar variance modification would be necessary as described in 3(b).

4. As we indicated in the proposed no-migration variance, EPA believes it would be difficult to justify a limit on an exact quantity of waste that should be placed in the WIPP during the test phase, since we don't know how much testing, in the end, will be needed. For example, based on the recommendations of the Engineering Alternatives Task Force, additional testing may be required for additional waste forms. Thus, we would not favor putting a specific quantity limit for wastes to go into the WIPP during the test phase. Rather, we believe that by conditioning our decision to only allow waste into the WIPP for testing and experimentation to demonstrate the long term viability of the repository, the amount of waste that would go into the WIPP will be limited to the absolute minimum needed. It should also be remembered that our proposed decision would require DOE to inform EPA of any additional testing, beyond that described in the Performance Assessment (Draft Final Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment. December 1989, DOE/WIPP 89-011). Thus, the Agency would be aware of any additional testing that was expected to be performed (with the quantity of waste needed) before the waste was placed in the WIPP.

5. EPA interprets the statutory language in subsections 3004 (d) - (g) of RCRA as allowing EPA to approve a variance from the prohibition on land disposal where a disposal unit will prevent hazardous levels of constituents from migrating beyond the unit boundary. EPA relied on this interpretation in the rulemaking setting the standards for the "no-migration" variance for underground injection wells. See 53 F.R. 28,116 (July 26, 1988).

This rulemaking was challenged by the Natural Resources Defense Council (NRDC) in NRDC v. U.S. EPA No. 88-1657 (D. C. Cir.). Oral argument was held on February 1, 1990. In its brief and at oral argument, NRDC argued for a stringent construction of the "no-migration" variance. Specifically, NRDC argued that the statutory phrase "no-migration of hazardous constituents from the disposal unit or injection zone for as long as the waste remains hazardous" means that a single molecule of a hazardous constituent listed in 40 CFR 261 Appendix VIII may not leave the unit boundary as long as a listed hazardous waste remains in the unit. EPA argued that the statutory language is ambiguous and that one permissible construction is that the phrase "for as long as the waste remains hazardous" refers to the waste that migrates *from* the unit and not the waste that stays in the unit. Moreover, EPA argued that there is authority to deem migrating waste to not be hazardous if the waste constituents fall below certain health-based standards.

The DC Circuit has not yet issued an opinion in this case. If the court adopts NRDC's position, it would probably not be possible for EPA to grant a "no-migration" variance for the WIPP (or any other facility). This is because the petition indicates that some molecules of Appendix VIII hazardous constituents will migrate beyond the unit boundary during the test phase and operation. It is difficult to assess the impact of a court decision partially upholding EPA's position or a decision which remands the regulation to the Agency on other grounds.

6. There were three major bases for the Court's remand of 40 CFR 191: further consideration of the interrelationship of 191 with Part C of the Safe Drinking Water Act; further explanation of the 1,000-year design criterion; and further notice and comment on the Groundwater Protection Requirements. These deficiencies were directly related only to two specific sections of the rule - Individual Protection (40 CFR 191.15) and Ground-Water Protection (40 CFR 191.16) Requirements.

Following the remand in July 1987, EPA and the Justice Department asked that the entire standard be reinstated except for the two sections with which the Court had problems. In September 1987, the Court reinstated Subpart A but left the entirety of Subpart B in remand. The Court was concerned that any changes made to the two sections may have impacts on the other section of the subpart and required the Agency to consider these possible impacts.

EPA's intent in re-drafting the standard is not only to address the legal issues raised by the Court but also, where appropriate, to update the technical basis of the standard so that it accommodates program changes that have occurred since 1985. For instance, in the intervening years, more data have been collected on the tuff site at Yucca Mountain and the bedded salt site at the

WIPP, and the Agency has undertaken a new set of repository performance analyses on these media.

The Agency understands and appreciates the interest in reissuing this standard promptly and is doing its best to expedite the re-drafting process without compromising the technical integrity or legal underpinnings of the rule.

7. In the Agency's view, neither the Subpart A management and storage standards nor the Subpart B disposal standards would be legally applicable to the WIPP unless and until it is designated as a disposal facility. DOE, as part of this effort, is proposing a range of laboratory scale, bin scale and alcove scale tests and experiments with transuranic wastes as part of its program to demonstrate compliance with the EPA disposal standards. DOE has committed to comply voluntarily with the Subpart A management and storage standards during this test period.

The Agency's view is that further testing is an important component of the DOE performance assessment program which will provide better information in determining compliance with the EPA disposal standards. As we have previously stated, it is imperative that any waste emplaced underground for experimental purposes remain retrievable until compliance with both the radioactive waste disposal standards and the requirement of no migration of hazardous waste has been demonstrated. As part of the current re-drafting of 40 CFR 191, EPA's Office of Radiation Programs is considering a provision which would require a determination of compliance before any waste is emplaced in the system except in cases where experimental placements of radioactive waste are deemed necessary for performance assessment purposes.

8. The Administration's bill does not change the implementing agencies, which in the case of WIPP is the Department of Energy (DOE). Therefore, it would be up to the DOE to determine what performance is necessary from the barriers to meet the release limits and assurance requirement in Part 191. It would be appropriate for the Department to use modeling, analysis, and expert judgment along with documentation to support its decision.

# POST-HEARING QUESTIONS AND ANSWERS

PAUL D. RICE
SUBCOMMITTEE ON THE WASTE ISOLATION PILOT PLANT
ADVISORY COMMITTEE ON NUCLEAR FACILITY SAFETY

APRIL 3, 1990

## ADVISORY COMMITTEE ON NUCLEAR FACILITY SAFETY

Answers to Questions from Senator Johnston:

1. You state in your testimony and in your Committee's letter report that the Department can now satisfactorily meet EPA's Subpart A standards for WIPP and that you are optimistic that the Department will eventually be able to meet the Subpart B standards.

a. Is that an accurate statement of your views?

Response 1a. Yes, we believe that the Department can now demonstrate compliance with the EPA's Subpart A standards and should be able to provide "reasonable assurance" that release quantities in Subpart B can eventually be shown to be met with the analytical data they now have.

b. Could you explain further to the Committee your concerns that the Department not be unnecessarily conservative in attempting to demonstrate compliance?

Response 1b. EPA's guidance in Appendix B of 40 CFR 191 for the intruder scenario, in our opinion, encourages "reasonable projections" for meeting Subpart B release quantities which may require the use of "qualitative judgments". Further, if one does not provide "reasonable projections" based primarily on ones own defensible analysis, then EPA provides a set of default values that could be used. It appears to us that DOE has based its assumptions on default values in a manner that, when taken as a whole, may be unnecessarily conservative. We believe DOE should prepare "reasonable projections" based on available data and expert judgement and put the results in a report for discussion of their adequacy and take the lead to discuss these assumptions and approach with the EPA.

2. You state in your testimony that before emplacement of waste in WIPP, the Department should have reasonable confidence that the EPA standards for disposal can be met.

a. What does "reasonable confidence" mean? How will the Department make that determination?

Response 2a. Upon assembly of the best expectation of data and analyses as reflected in Response 1b above, the Department should show that the projected releases are within 40 CFR 191 Subpart B quantities. If not, they would have difficulty showing they have reasonable confidence that Subpart B can be met, and should not proceed with waste emplacement until they do. We believe Admiral Watkins should be able to expect such a level of confidence before he is asked to make a decision about waste emplacement.

b. In your opinion, is the Department proceeding on the proper path to accomplish this?

Response 2b. The Department is probably on a path that will eventually bring together the data. However, we have continued to advise the Department against placing too much reliance on the test program to provide more than we believe it will provide in the time frame planned. We believe that DOE will eventually have to examine "qualitative judgments" it can examine now, as indicated in response 1b, or it will have to proceed with engineering modifications, that would result in Subpart B compliance without changing current assumptions.

3. In your testimony, you talk about potential need for engineering modifications at WIPP.

a. What does this mean? What types of things are considered engineering modifications? How much will this cost?

Response 3a. Engineering modifications, as used by the Committee, would include, but not be limited to, (1) changes in the waste form, such as by incineration or vitrification; (2) backfill alternatives, including the use of salt only, salt plus gas getters, salt plus sorbents, and compacted backfill; (3) waste management alternatives, including minimizing the space around the waste stack, waste segregation, decreasing the amount of waste in each room, and emplacing the waste and backfilling simultaneously; and (4) facility design alternatives, including brine isolation dikes, brine sumps and drains, brine sorbent material, facility venting, and changes in room configuration.

The Department is in the process of ranking the many potential engineered alternatives and, to our knowledge, has not yet developed cost estimates.

4. It is generally agreed that gas generation is one of the major issues to be resolved at WIPP. You state in your testimony the need to study ways to mitigate any undesirable buildup of gas pressure and ways to reduce gas generation.

a. What can we do to the waste to accomplish this?

Response 4a. A number of potential engineered alternatives for the waste form have been identified and are being evaluated, together with the facility alternatives, by a DOE Engineered Alternatives Task Force. The engineered alternatives for the waste form that are being evaluated with respect to gas generation and other parameters include supercompacting, thermal treatment, chemical additives, immobilization, reprocessing and changing the waste container material and shape. Supercompacting is being considered to reduce the volume of waste at the waste generator sites and, also, to increase waste stability and somewhat reduce porosity and permeability to brine flow; a supercompactor is being constructed and tested for operation at the Rocky Flats Plant. Thermal treatment, such as by incineration or plasma processing, would reduce the waste to its elemental constituents and drive off undesirable gases. Chemical treatment, such as by the addition of copper sulfate or gas getters, would change the composition or absorb the gases. Immobilization, such as by vitrification, would imbed the waste in an inert material.

b. Is the Department pursuing this goal as aggressively as it should be?

Response 4b. The Department has informed the Committee that the Engineered Alternative Task Force will report their results in June 1990. This report will better characterize the Department's actions and plans in this area.

# POST-HEARING QUESTIONS AND ANSWERS

DR. CHARLES FAIRHURST
CHAIRMAN
PANEL ON THE WASTE ISOLATION PILOT PLANT
BOARD ON RADIOACTIVE WASTE MANAGEMENT
NATIONAL RESEARCH COUNCIL

APRIL 3, 1990

FOLLOWUP QUESTIONS FOR CHARLES FAIRHURST

From Senator Johnston

1. The NAS Panel on WIPP states in its report that the Department's proposed transportation system is safer than that employed for any other hazardous material in the United States.

a. Could you elaborate on that?

b. Why do you think that transportation issues attract so much attention and concern when we transport hazardous materials on the roadways every day?

c. How do you think we should resolve the public's concerns about transportation? Should we build new roads everywhere as a way to allay these fears?

TESTIMONY BY CHARLES FAIRHURST
(Chairman, NAS-WIPP Panel)
before
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
April 3, 1990

Responses by Charles Fairhurst to

Follow-Up Questions from Senator J. Bennett Johnston

Qu 1. The statement referred to appears to be the following part of Recommendation 4 in the WIPP Panel's (July 1989) report:

> "the high level of attention given [by the Department of Energy] to TRU waste transport is appropriate for shipment of all hazardous materials, almost all of which pose greater risk than the TRU shipments"

and the following extract from the supplementary comments on Recommendation 4:

> ...the "high profile" and comprehensiveness of the states training and education program may give a false impression that TRU waste is more hazardous than a variety of other hazardous materials, some posing a significantly greater risk, that are routinely handled in the same states and on the same highways with no special precautions.

These comments were based on a detailed presentation to the Panel by Department of Energy (DOE) officials, of the very stringent procedures employed in the development of a TRU-pack capable of surviving, intact, a variety of extreme situations. These included repeated drops of the pack, (tilted to hit on a corner) from a height of 30 feet onto a thick concrete slab; repeated drops from about 10 feet onto a long steel spike; submersion of the pack into a pit full of aviation fuel, which is then ignited so that the exterior of the pack attains a temperature of 1200°F for at least 30 minutes; the TRU pack must retain its integrity through all of these tests. Fuller, and more precise details of the TRU-pack testing program may be found in the Safety Analysis Report for the Trupact II Shipping Package, Rev. IV, August 1989, available from Nuclear Packaging Inc., Federal Way, Washington, D.C.

DOE has also developed a comprehensive safety program, incorporating a satellite system for continuous pin-point tracking of all TRU vehicles in transit nation-wide; training and education programs to state police and transportation officials, etc.

Further, the TRU-waste consists essentially of solid material, ie. it contains no liquids or compressed gases (as do many hazardous materials transported as part of regular traffic on the nation's highways). This, together with the high standard of container design and monitoring system, results in a very low level of transportation risk for the TRU waste, compared with most other hazardous materials transported by road.

with most other hazardous materials transported by road.

Qu's 2,3. I do not consider the WIPP Panel to have the appropriate professional backgrounds to provide expert responses to these questions. Consistent with our belief that the risk posed by transportation of TRU-waste packs is very low, the Panel does not consider the building of new roads a response to real safety considerations. Rather, such highway construction appears to be a means of rewarding states or communities in order to gain greater public acceptance of TRU waste transportation routes.

As a strictly personal opinion, I believe that the word 'radioactive' connotes 'cancer', and 'insidious long term genetic harm' in the minds of the public. The horrors of Hiroshima, Nagasaki, fears of "Nuclear Winters," and nuclear wars; and incidents such as Chernobyl and Three Mile Island, evoke deep fears and mistrust of anything 'radioactive'. Much of the public makes no distinction between various categories and intensities of radioactivity. It will be a long hard process to convince the public that some aspects of radioactivity can be dealt with safely, e.g. the safe isolation from the biosphere of wastes from nuclear power and weapons production.

CF:am

cc: Dr. Frank Parker, Chairman, Board on Radioactive Waste Management (BRWM)
Dr. Peter Myers, Staff Director, BRWM

# APPENDIX II

## Responses to Questions From April 26, 1990, Hearing

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# POST-HEARING QUESTIONS AND ANSWERS

TOM BAHR
ROBERT W. BISHOP
ARTHUR S. KUBO
LEONARD C. SLOSKY
B. NEWAL SQUYRES

DEPARTMENT OF ENERGY BLUE RIBBON PANEL
ON THE WASTE ISOLATION PILOT PLANT

APRIL 26, 1990

FOLLOWUP QUESTIONS FOR MEMBERS OF THE BLUE-RIBBON PANEL
April 26, 1990

From Senator Johnston

### Modified Waste Forms

Each of you expressed some concern about the potential need to treat waste or modify the waste form prior to the time that it is placed in WIPP for permanent disposal. As I understand it, each of you generally believe that it will be either necessary or desireable to modify the waste form prior to permanent disposal. Some of you have also stated that it might be appropriate to experiment with some treated or modified waste during the 5-year test phase.

1. In your opinion, how far away is the Department of Energy from making decisions on whether to modify the waste form?

2. Could these decisions be accelerated?

3. Would it make any sense to delay the test phase until these decisions are made?

4. Would it be feasible and/or appropriate to make some tentative decisions now, or soon, on modifications to the waste form so that experiments could be conducted on modified waste forms during the test phase?

5. Could experiments on modified waste forms be conducted in parallel to those experiments already planned for the test phase? Should they be?

6. If these experiments were conducted in parallel, would additional volumes of waste be needed or justified? How much?

7. Has the Department looked at the possibility of conducting experiments on more than one waste form during the test phase? If not, should the Department do so?

### Bin-scale tests

Witnesses have testified that the bin-scale tests do not need to be conducted in WIPP and some have suggested that these tests could be done elsewhere immediately.

1. Where else could these tests be conducted? Is any other DOE facility currently equipped for these tests?

2. How quickly could facilities be constructed or equipped elsewhere for the bin-scale tests? Approximately how much would it cost to build facilities elsewhere?

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New Mexico Water Resources Research [illegible]
New Mexico State University •Telephone (505) 646-4337 • Box 30001, Dept. 3167, [illegible]

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SENATE COMMITTEE ON
ENERGY AND NATURAL RESOURCES
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MAY 30 1990
WASHINGTON, D.C. 20510

May 15, 1990

The Honorable J. Bennett Johnston, Chairman
Committee on Energy and Natural Resources
United States Senate
Washington, D.C. 20510-6150

Dear Mr. Chairman:

I appreciate the opportunity to have been able to testify before your April 26, 1990 hearing and in response to your follow up questions of April 30, 1990 I offer the following:

Modified Waste Forms

**Each of you expressed some concern about the potential need to treat waste or modify the waste form prior to the time that it is placed in WIPP for permanent disposal. As I understand it, each of you generally believe that it will be either necessary or desireable to modify the waste form prior to permanent disposal. Some of you have also stated that it might be appropriate to experiment with some treated or modified waste during the 5-year test phase.**

**1. In your opinion, how far away is the Department of Energy from making decisions on whether to modify the waste form?**

> DOE presently has a working Task Force to examine potential engineered alternatives to the present waste forms now in storage and for waste to be generated in the future. This Task Force is scheduled to issue its recommendations in early 1991 and DOE has indicated they would be making a final decision in 1993. My sense is that DOE has already conceptually accepted the notion that some type of waste modification may be needed or they would not have established a Task Force to study it.

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**2. Could these decisions be accelerated?**

Yes. More resources, both in-house and through contractors, could be put on evaluation of engineered alternatives such that the information needed to make these decisions could be moved up by perhaps 18 months. The desirability of accelerating these decisions, however, must carefully consider issues of reallocations of finite resources and subsequent trade offs in other DOE programs.

**3. Would it make any sense to delay the test phase until these decisions are made?**

Absolutely not. Current performance assessment calculations are seriously limited by "real-world" data. The ultimate selection of a final waste form or redesign of the repository configuration will require data from the test phase.

**4. Would it be feasible and/or appropriate to make some tentative decisions now, or soon, on modifications to the waste form so that experiments could be conducted on modified waste forms during the test phase?**

Yes, it is both feasible and appropriate. Super compacted drums (one modified waste form) is already scheduled for testing and it is my understanding that additional waste forms are already being given considerations for early bin-scale testing. Testing of numerous different waste forms need not wait on findings of the Engineering Alternatives Task Force because many alternatives have already been identified.

**5. Could experiments on modified waste forms be conducted in parallel to house experiments already planned for the test phase? Should they be?**

Yes, they can and should be conducted.

**6. If these experiments were conducted in parallel, would additional volumes of waste be needed or justified? How much?**

As I stated in my testimony, a limit of 0.5 percent (4,400 drum equivalents) of the WIPP capacity for experiments could preclude emplacement of additional modified waste forms for test purposes. Additional volumes of modified waste are certainly justified and a reasonable upper limit for all tests would be 1 percent of the WIPP waste capacity.

**7. Has the Department looked at the possibility of conducting experiments on more than one waste form during the test phase? If not, should the Department do so?**

Yes as I indicated in question 4 above. I consider such testing to be very important and tests should begin as soon as the legal and technical constraints are worked out.

**Bin-scale tests**

**Witnesses have testified that the bin-scale tests do not need to be conducted in WIPP and some have suggested that these tests could be done elsewhere immediately.**

**1. Where else could these tests be conducted? Is any other DOE facility currently equipped for these tests?**

To my knowledge there are no other facilities where bin-scale testing could be started immediately.

**2. How quickly could facilities be constructed or equipped elsewhere for the bin-scale tests? Approximately how much would it cost to build facilities elsewhere?**

In my opinion, one could construct and equip a suitable facility in less than a year if construction started today. Obtaining the necessary permits and satisfying all regulatory requirements however, could take an additional year or even more. DOE has stated that facility construction could cost as much as $20 million.

Again, I would like to thank you for the opportunity to provide my comments on this vitally important project. I would be more than happy to follow up in more detail on any of the above questions or others you may have

Sincerely,

Tom Bahr

Tom Bahr, Member
WIPP Blue Ribbon Panel

TB/tm

Robert W. Bishop
2937 Cathedral Avenue, N. W.
Washington, DC 20008

May 15, 1990

The Honorable J. Bennett Johnston
Chairman, Committee on Energy and
Natural Resources
United States Senate
Washington, D.C. 20510

Dear Senator Johnston:

As a follow-up to the testimony of the Department of Energy's WIPP Blue Ribbon Panel on April 26, 1990, you have asked us to respond to a series of additional questions related to modified waste forms and bin-scale tests associated with the WIPP project.

With respect to waste form modification, although I agree that there may be a need to treat waste or to modify the waste form to ensure that WIPP can meet appropriate land disposal criteria, I do not believe that we have a technical basis at present to determine if modifications are required and what the nature of those modifications might be. It is important to develop the technical basis for those decisions, and that underscores my recommendation that the in situ testing begin at WIPP as soon as Admiral Watkins has determined that it is appropriate, and assuming that land withdrawal questions have been resolved, to enable the experiments to take place that can provide the data necessary to make those decisions. The Department of Energy is proceeding, through a Task Force, to identify what waste treatment or waste forms might be appropriate and the feasibility, including the cost and benefit, of each of those possibilities. That effort must continue, and I and the other Members of the Blue Ribbon Panel have separately provided our comments to DOE to assist them in correctly focusing that effort. However, no decision can be made until more is known about the chemical, radiological, and geological behavior of the waste, and that insight can only be gained by conducting the Test Phase. That, of course, requires that the wastes to be used in the experiments be characterized to the degree necessary to provide reasonable confidence that the test results can provide meaningful insight.

In response to the specific questions posed, I do not believe that it would be appropriate for DOE to make a decision on waste treatment or waste form modification until it can be determined, with a reasonable degree of certainty, that the appropriate regulatory criteria cannot be satisfied without those enhancements. (As I stated in my April 26, 1990 testimony, I remain deeply troubled by the failure of EPA to develop standards directly applicable to transuranic wastes and the WIPP facility, and DOE's apparent willingness to attempt to meet those admittedly arbitrary standards rather than forcefully advocating what is right. DOE and EPA must work together to ensure that appropriate standards are developed, and that those standards can be implemented, so that transuranic wastes can be safely disposed of.) Prosecution of the Test Phase is a necessary precursor for a decision to be made as to what engineered enhancements may be required. It makes no sense at all to consider delaying the Test Phase until these decisions can be made; rather, the Test Phase must be utilized to develop data to enable correct decisions to be made and the uncertainties about facility performance reduced -- it may well be that no enhancements are required, and it would be ludicrous to expend significant sums of money and to subject workers to needless occupational exposure to do modifications that are not technically justifiable.

I believe that, within the next six months, the initial assessment of the relative merits of potential waste form modifications could be completed such that it would make sense to conduct additional experiments to validate the expected performance of the waste in that modified condition. That process should be conducted in parallel to the current test plan, once a technically justified decision can be made of the best potential candidates. As I described in my April 26, 1990 testimony, a few additional tenths of a percent of the total WIPP facility volume may be necessary to conduct those validation tests. It is for that reason that I recommended that, if a legislative cap on the amount of waste to be emplaced during the Test Phase is adopted, a limit of 1.0% would be appropriate to allow for the necessary evolution of the tests to be conducted during the Test Phase, including the test of candidate modified waste forms. As I testified, the waste volume to be used in the Test Phase should be as small as possible so that the cost, both economic and in terms of resources, of retrieval is as small as possible if it is subsequently determined that the waste must be repackaged, the waste form altered, or that the WIPP project is not viable. Consistent with that principle, I have recommended to DOE that any modified waste form tests should be limited to the most likely candidates or to those modifications that would establish bounding conditions on waste performance.

With respect to the conduct of bin-scale tests away from WIPP, I concur with the views stated by Mr. Slosky in his testimony before the Committee on April 26, 1990. Because the bin experiments are conducted in enclosed metal containers isolated from the surrounding environment, these experiments could be conducted at WIPP or at any other facility suitable for, and permitted for, handling transuranic and transuranic mixed wastes in a controlled environment that would replicate the WIPP facility. To my knowledge, no other DOE facility is currently able to conduct those experiments. Such a facility would, of course, also have to be licensed to handle transuranic and transuranic mixed wastes, and have to be able to handle TRUPACT II shipments. In an engineering sense, a facility could be constructed, or a current facility modified, to duplicate the temperature environment at the WIPP facility so that the bin-scale experiments could be conducted. However, there would always be an unanswered question as to how closely the WIPP conditions were replicated at that facility, thus creating a continued uncertainty about the validity of the results of those experiments. Those questions are removed, and significant additional expenditures avoided, if the WIPP facility is allowed to be utilized, consistent with its Congressionally established statutory mandate, "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States...." National Security and Military Applications of Nuclear Energy Authorization Act of 1980. With respect to the specific questions regarding the time and money required to develop one or more facilities to replicate the WIPP conditions so that bin-scale tests could be done other than at WIPP, I am not privy to the evaluations that DOE has conducted, but I believe that a reasonable estimate is tens of millions of dollars of technically needless expenses and two or more years of needless delay. That notwithstanding, because of the necessity of beginning the Test Phase so that data can be collected and evaluated to reduce the uncertainties associated with assessing the WIPP facility's long-term performance, alternative locations should be evaluated for possible use if significant delays occur in initiating the bin-scale experiments at WIPP.

However, the alcove tests can only be conducted at WIPP. Because the alcove tests will be more representative than the bin-scale tests of actual repository conditions and the performance of representative waste, those experiments are crucial to better understanding of the complex interactions between the wastes and the disposal environment and thus providing a basis for a decision regarding whether WIPP will be a suitable environment for the safe, permanent disposal of transuranic wastes.

In sum, the only practical, reasonable and effective way to be able to assess whether WIPP is an appropriate disposal facility is to proceed promptly with the Test Phase at WIPP. The appropriate and most prudent course of action is for land withdrawal, either legislative or administrative, to be completed so that the necessary experiments can begin at WIPP as soon as Admiral Watkins determines it is appropriate to do so. I cannot condone
actions which are not consistent with finding a way to dispose of transuranic wastes so as to, as Congress stated in the Resource Conservation and Recovery Act, "minimize the present and future threat to human health and the environment." Our responsibility to resolve these issues cannot be shirked.

I would be pleased to answer any further questions you might have and otherwise assist the Congress, the Department of Energy and the Environmental Protection Agency in addressing and resolving this important matter.

Sincerely,

Robert W. Bishop
Member
WIPP Blue Ribbon Panel

RWB:bb

**Dr. Arthur S. Kubo**
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May 15, 1990

The Honorable J. Bennett Johnston
Chairman
Committee on
Energy and Natural Resources
United States Senate
Washington, DC 20510-6150

My dear Senator Johnston:

I would like thank you and the members of your committee for inviting me to testify before the Committee on Energy and Natural Resources on the Department of Energy's Decision Plan related to the opening of the Waste Isolation Pilot Plant in Carlsbad, New Mexico and the withdrawal of the public lands surrounding the WIPP site.

Attached are my answers to your questions of April 30, 1990.

Further, I would like to make two comments:

1. In response to Senator Domenici's concern to continue pressure on DOE in moving forward with WIPP and complete the outstanding actions, I hope that there is a way to both keep the pressure on DOE and move forward with the performance assessment experiments. At present, there is insufficient data to make good decisions for our nation. We currently have over 200,000 drum equivalents of TRU/Mixed TRU in various surface and near-surface temporary storage sites. Some of these drums have been in temporary storage for over 30 years. These drums are corroding, they will eventually contaminate important fresh water aquifers, and once corroded they will be extremely hazardous to recover. We must move forward and establish a permanent, safe repository for this waste.

2. In response to Senator Bingaman's question concerning the validity of EEG's gas generation calculations, I would like to expand on my response at the hearing. The gas calculations accomplished by EEG were based on theoretical and laboratory (small scale) experimental data. These calculations assumed one of the more conservative scenarios. The actual gas generation problem is a very dynamic interplay between the inflow of brine from the surrounding salt bed into the disposal rooms versus the rate of gas build up coupled with the room closure rate. These complex interactions are not well understood. EEG's calculations were correct as far as they went but did not account for these coupled interactions.

Thank you again for permitting me to be of service to you and the Committee.

Sincerely,

Arthur S. Kubo
Panel Member
WIPP Blue Ribbon Panel

Incl: as

ASK:ask

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# MODIFIED WASTE FORMS

## INTRODUCTION:

The WIPP Program is vulnerable to both regulatory and technical uncertainties. Regulatory concerns are compounded because of the radioactive and hazardous waste regulations that apply. About 60 percent of the WIPP inventory will be mixed waste. EPA does not have an approved procedure for granting a No-Migration Variance Petition under 40 CFR 268 so that the WIPP experiments can begin. RCRA authority for the WIPP repository will transfer from EPA to New Mexico. Finally, 40 CFR 191 requires consideration of potential future human intrusion with restrictive conditions for site control and limited technological capability attributed to the intruders.

DOE embarked on an unmodified TRU waste disposal WIPP strategy from the beginning. Disposal of unmodified waste if human intrusion does not occur is safe, the most inexpensive salt bed disposal option, and the lowest risk and least complex operational waste form process. This safety assessment of a "no intrusion" repository is almost unanimously agreed to by all credible reviewers of the WIPP Program irrespective of the mixed waste issue.

It is the potential of human intrusion that confuses the safety question. The potential for intrusion and the intruders' technological capability at the time of entry is an unquantifiable judgement. This judgement should be made separately by each of us. On the other hand, WIPP in the balance provides a safer and single disposal site alternative than currently exists at the multiple, surface and near-surface storage facilities (that may become our nation's ad hoc disposal sites if WIPP fails) for over 200,000 waste drums of TRU and Mixed TRU wastes. Further delays in the WIPP Program risks extreme waste container deterioration at many of these sites with the potential contamination of important and useful fresh water aquifers.

Therefore, it is important that we get on with resolving the TRU/Mix TRU waste disposal problem. My simple view is to look at the risk of WIPP with and without human intrusion. If in the judgement of the observer we mortgage our future unduly, then we must strongly consider modifying the waste form to finesse the regulatory and technical uncertainties that will continue to ensnarl the WIPP Program.

To address the technical issues of the disposal room environment, DOE currently is assessing Engineered Alternatives and Modifications to mitigate potential releases of radioactive and hazardous materials from the WIPP repository. The range of alternatives will consider the WIPP TRU/Mixed TRU waste forms, the waste room backfill material, and the WIPP facility design. There are three major contributors that dominate the technical uncertainties associated with the WIPP repository based on the current regulations.

1. The geologic and geohydraulic characteristics of the WIPP site,

2. The chemical, porosity, permeability, and gas generation characteristics of the current waste forms, and

3. The possibility of future human intrusion.

Of these important parameters, the waste form(s) characteristic is the only key variable that one can control. The importance of the waste form(s) characteristic impacts WIPP safety in two ways:

1. To accomplish meaningful experiments, the initial waste must be characterized to interpret the results. This includes understanding the key variables that affect gas generation, radioisotope solubility in brine, waste porosity, and waste brine permeability, in addition to the more readily measured parameters of mass, volume, head gas, and radionuclide content. The basis for this uncertainty is the current "process knowledge" methodology used to characterize currently generated waste and lack of characterization of the old, buried waste. There are no EPA approved mixed waste characterization procedures today.

2. To extrapolate the experimental results to the on-hand (both old, buried at Idaho, and currently generated waste) and future inventory, these inventories must

be characterized.

The Department of Energy (DOE) is currently working with EPA to develop a waste characterization plan for the experimental and current inventory waste. This plan has just been published in draft.

The current published (and earliest) schedule to begin the Performance Assessment Experiments is as follows (DOE's WIPP Test Phase Plan: Performance Assessment, April 1990):

1. Bin Tests - The current start date is now identified as "TBD," with an earliest start date during the first quarter CY1991. Previous test plans suggested that each phase would take about six months to emplace and instrument with the first useable data arriving about six months thereafter. Further, previous plans have indicated that the three phases of the bin scale-tests would be emplaced and instrumented sequentially. If this sequential strategy is unchanged, phase 3 will be emplaced and instrumented by the third quarter CY1992 with initial phase 3 data arriving in the first quarter CY1993.

2. Alcove Tests - Waste Emplacement Only, Data after last date:

Phase 1 - Alcoves 1 & 2 - February 91 to June 91

Phase 2 - Alcoves 3 to 6 - July 91 to June 92

Useable data will be available six months after the start of each phase of the bin tests and one year after the closure of each room in the alcove tests.

The current DOE test program does not explicitly look at modified waste forms until Phase 3, Bin Tests, although supercompacted waste will be tested during phases 1 and 2 of the Bin Test and phase 2 of the Alcove Tests. Supercompacted waste is one of the potential modified waste forms, but as originally planned this form was included because it is a potential Rocky Flats Waste form. Sixty-four of 608 drums (about 10%) of the phases 1 and 2 bin tests and 700 of 3850 drums for the phase 2 alcove tests will be supercompacted waste. (Test Plan: WIPP Bin-Scale CH TRU Waste Tests, Sandia National Laboratories, January 1990, and Test Plan: WIPP In Situ Alcove CH TRU Waste Tests, Sandia National Laboratories, January 1990.) As currently sequenced, the test plans for the Alcove Tests would be complete and the waste emplaced prior to obtaining data from the Phase 3 tests. Today, the Alcove Test Plans do not included modified waste forms (less supercompacted waste).

If the bin tests are sequentially executed and the tests begin in the first quarter CY1991, the modified waste form decision is unlikely before the last quarter CY1993 or early CY1994. This schedule can further slip depending upon the passage of the land withdrawal legislation and the granting of the no migration petition. At this point, all delays cause a day-for-day slip in the test program, the analysis of experimental data, and management decisions necessary to move the WIPP program to resolution.

The essential issue with waste form modification is to reduce the uncertainty that surrounds the disposal environment. There are two essential groups of data that will technically decide this issue. First, are the current waste forms understood well enough to do a meaningful experiment? This is the major point of the current experimental program. There is inadequate experimental data to make this judgement at this time. This does not imply that the current waste forms are unsafe for disposal, but rather they are uncharacterized, and therefore the implications of their behavior in the repository is uncertain. It is important to obtain the characterization data because if it can be demonstrated to be safe, the current disposal concept is the least costly - in dollars, schedule, and operational safety. The second issue then becomes, will the experimental program adaquately reduce the uncertainty of the analytically based performance assessment process to demonstrate that the current waste forms are safe for disposal? This is a very difficult question, but my current assessment is that it is unlikely that the analytical technique that must combine the uncertainty of the in situ geology and hydrogeology with the remaining uncertainty in waste behavior compounded by human intrusion will satisfy the legitimate criticisms of the WIPP program. There needs to be a parallel program that considers waste form modification to reduce the risk of achieving a technically credible and compliant WIPP Program.

In sum, modifying the waste form finesses the technical and regulatory uncertainties that encumber WIPP. Waste form modification is more conservative, potentially more costly, and implies additional permitting requirements; however, this conservatism may be necessary to open WIPP as the first deep geologic repository of a National Program to safely dispose of all nuclear waste.

RESPONSE TO SPECIFIC QUESTIONS:

Q1. In your opinion, how far away is the Department of Energy from making decisions on whether to modify the waste form?

Answer: Based upon the current plan and assuming a first quarter calendar year 1991 start of the in situ test program, the modified waste form decision will be made in late 1993 or early 1994. At present, DOE has not publically discussed an alternative waste form strategy that would be conducted in parallel with the main line WIPP experimental program, although the Engineered Alternatives and Modifications initiative is the first step in this process.

Q2. Could these decisions be accelerated?

Answer: The current schedule for the Engineered Alternatives and Modifications initiative is as follows. The initial report on alternative waste forms for incorporation into the bin-scale experimental program was submitted on March 23, 1990. On July 31, 1990, the draft technical reports that describe the final design model, and the viable engineered alternative options with respect to technical, regulatory, cost and project schedule criteria are scheduled for publication. A draft of the final report will prepared by November 30, 1990 with the final report completed by February 28, 1991.

Based on the above schedule, a waste form decision can be accelerated. First, plans can be initiated to begin phase 3 as soon as possible to test for alternate waste forms. It takes about a year to develop the test plan and review it. Additionally, it will take time to obtain the modified waste for testing, e.g., incineration of TRU waste is not a current practice. Following the February 28, 1991 publication of the final report, DOE could initiate a study, short of actual design, of waste modification plant facilities and permitting requirements. Concurrently, DOE could convene a formal review group to review the WIPP experimental data on a semiannual basis to make a timely waste modification decision. If modification becomes likely, the modification plant study can be taken to increasing levels of maturity including fulfilling the National Environmental Protection Act, final design and permitting, etc.

There is a risk in taking this proactive dual track management strategy. Waste modification is a conservative but more expensive method of preparing the waste for disposal. Waste form modification is more costly, could possibly delay (this is unclear if the untreated waste form option is contested legally) the opening of WIPP as an operational facility, will cause greater occupational exposure to the work force, and will require additional permitting and safety analyses. Lastly, there is a potential that once started waste modification will occur without regard to the technical findings of the performance assessment experiments. The national forum to decide these issues must balance these costs and benefits.

Q3. Would it make any sense to delay the test phase until these decisions are made?

ANSWER: The test phase should not be delayed. There are no experimental data today to justify accepting the current waste form or modifying it. The currently planned bin tests, phases 1 & 2, are justified to obtain the data to assess the performance of current waste forms when placed in WIPP. This is the baseline option for WIPP. If in situ testing were allowed today, the logistics of getting the waste to any test site, WIPP included, would permit an early start no sooner that 1991. Combined with the time it takes to emplace and instrument the waste, modified waste form testing could begin about the time that the current Phases 1 & 2 are in place.

Q4. Would it be feasible and/or appropriate to make some tentative decisions now, or soon, on modifications to the waste form so that experiments could be conducted on modified waste forms during the test phase?

ANSWER: Yes. In addition to my answer to Question 2, DOE could begin to identify the capability to obtain experimental quantities of appropriately modified TRU/Mixed TRU waste. This includes the capability to modify and to characterize the modified and unmodified TRU/Mixed TRU waste. Further, modified waste forms available at the start of the bin tests could be integrated into the phase 1 and 2 tests.

Q5. Could experiments on modified waste forms be conducted in parallel to those experiments already planned for the test phase? Should they be?

ANSWER: Modified waste form experiments should be conducted in parallel with the currently planned performance assessment tests, but waste characterization, transportation, and emplacement logistics may preclude this. (See previous comments.) I believe the best alternative now is to push on vigorously to get the currently planned tests started. Concurrently, the modified waste form test program should be planned and executed as soon as ready. The scope of this program should look at a range of reasonable methods to modify the waste, rather than taking a step wise strategy that looks at incremental improvements. The philosophical point at issue with the current program is the single track program orientation to dispose of the TRU waste in an unmodified form. This has put DOE in a sequential decision making process that risks an abrupt stop or redirection. The specific waste form selected should be determined at a national level with technical recommendations supported with cost benefit data provided by DOE. The cost-benefit comparison can be based on the results of a performance assessment analysis (risk) for an alternative and the cost to achieve it. DOE has this capability.

Q6. If these experiments were conducted in parallel, would additional volumes of waste be needed or justified? How much?

ANSWER: Yes, additional volumes of waste will be needed to demonstrate the modified waste options. The specific amount of additional volumes of waste to test alternative waste forms should await the Final Report on Engineered Alternatives and Modifications due in February 1991. As a reasonable minimum estimate, the additional waste needed should about double the scope of the bin-scale experiment from 608 to about 1200 drum equivalents, about .57 percent of the WIPP capacity. However, DOE should have the flexibility to conduct needed experiments bounded by an upper limit of one percent of the proposed WIPP inventory. Further, the timing of the alcove tests might need adjustment to accommodate the modified waste experimental data.

Q7. Has the Department looked at the possibility of conducting experiments on more than one waste form during the test phase? If not, should the Department do so?

ANSWER: There are two waste forms currently being considered in the Performance Assessment Tests – as is, and Supercompacted. The Department should consider testing various modified waste forms as soon as reasonable during the bin tests. (See comments above.)

## BIN-SCALE TESTS

### INTRODUCTION:

The bin-scale tests require a constant temperature facility. Chemical reaction and bacterial growth rates are temperature sensitive. There is a remote and insignificant risk of extraneous bacterial contamination of the test bins depending upon test location. A constant temperature facility that emulates the in situ WIPP environment would be an appropriate test facility. Because of the mixed waste, permitting and safety analyses must be completed for a new test facility. The following questions are addressed in this context.

Q1. Where else could these tests be conducted? Is any other DOE facility currently equipped for these tests?

> ANSWER: These tests could be conducted at any constant temperature facility that has 10,000 square feet (Phases 1 & 2) and another 10,000 square feet (Phase 3, Alternative Waste Forms). The current tests are planned in a similar working area -- 2 rooms of 33 x 300 feet. I personally do not know of a constant temperature DOE facility that can accommodate this size test. My major concerns with accomplishing a test away from WIPP are (1) will this become another

temporary storage facility (and perhaps another ad hoc disposal site) and (2) will it delay the start of experiments?

Q2. How quickly could facilities be constructed or equipped else where for the bin-scale tests? Approximately how much would it cost to build facilities elsewhere?

ANSWER: It would take between one and two years to put into operation a constant temperature test facility without a supporting laboratory facility assuming routine permitting and safety analyses requirements. DOE could best provide the cost estimate for a new test facility.22

SLOSKY & COMPANY, INC.

May 14, 1990

OFFICIAL COMMITTEE FILE
PLEASE RETURN

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural
Resources
United States Senate
Washington, D.C. 20510-6150

Dear Senator Johnston:

This is in response to your letter of April 30, 1990. I am pleased to provide the following answers to the questions posed to the Blue Ribbon panel as a result of the April 26, 1990, hearing of the Committee on Energy and Natural Resources concerning the WIPP Decision Plan.

**MODIFIED WASTE FORMS**

**Each of you expressed some concern about the potential need to treat waste or modify the waste form prior to the time that it is placed in WIPP for permanent disposal. As I understand it, each of you generally believe that it will be either necessary or desirable to modify the waste form prior to permanent disposal. Some of you have also stated that it might be appropriate to experiment with some treated or modified waste during the 5-year test phase.**

1. **In your opinion, how far away is the Department of Energy from making decisions on whether to modify the waste form?**

   My understanding is that the DOE Engineering Alternatives Task Force that is studying potential modifications to the current waste forms is scheduled to issue final recommendations the end of February 1991. However, under its current approach, DOE is not expected to make a final decision on waste form(s) until 1993.

2. **Could these decisions be accelerated?**

   I feel that it could be very detrimental to the WIPP program to rush this decision. The waste form decision is very complex, involving trade-offs among technical, economic, regulatory, and political factors that require careful analysis.

   However, I believe that the waste form decision could be made by late 1991 or early 1992.

**3. Would it make any sense to delay the test phase until these decisions are made?**

> No. The test phase should not be delayed until the ultimate waste form decision is made. The test phase should begin as soon as possible to gather data on the performance of current waste forms in WIPP. The widest possible variety of alternative waste forms should be included in the test phase as soon as possible.

**4. Would it be feasible and/or appropriate to make some tentative decisions now, or soon, on modifications to the waste form so that experiments could be conducted on modified waste forms during the test phase?**

> See responses to questions #2 and #3. The waste form decision should not be made without careful analysis. However, a wide variety of waste forms should be included in the test phase as soon as possible.

**5. Could experiments on modified waste forms be conducted in parallel to those experiments already planned for the test phase? Should they be?**

> Yes. Experiments on modified waste forms could and should be conducted in parallel with the already planned experiments.

**6. If these experiments were conducted in parallel, would additional volumes of waste be needed or justified? How much?**

> Yes. Experiments with modified waste forms would require additional waste volumes. I believe that an additional waste volume of about 4,400 drums, which is equal to 0.5 percent of WIPP's capacity, should be adequate for experiments on modified waste forms.

**7. Has the Department looked at the possibility of conducting experiments on more than one waste form during the test phase? If not, should the Department do so?**

> Yes. The *WIPP Test Phase Plan: Performance Assessment*, DOE/WIPP 89-011, Revision 0, April 1990, indicates that modified waste forms will be included in the bin-scale tests. In addition, I would recommend that after a tentative decision on waste form(s) is made, the selected waste form(s) also should be included in the alcove tests.

**BIN-SCALE TESTS**

**Witnesses have testified that the bin-scale tests do not need to be conducted in WIPP and some have suggested that these tests could be done elsewhere immediately.**

**1. Where else could these tests be conducted? Is any other DOE facility currently equipped for these tests?**

> The Blue Ribbon Panel has not assessed the availability of DOE facilities other than WIPP to conduct the bin tests. DOE has informed the Blue Ribbon Panel that no suitable DOE facility is currently available to conduct the bin tests.

**2. How quickly could facilities be constructed or equipped elsewhere for the bin-scale tests? Approximately how much would it cost to build facilities elsewhere?**

> The Blue Ribbon Panel has not assessed the time or costs of developing a facility other than WIPP to conduct the bin tests. I understand from DOE that 12 to 16 months and $10 million to $20 million would be required to develop a suitable facility for the bin tests, outside of WIPP.

I hope that my answers to these questions will be helpful to the Committee. Please feel free to contact me if I can be of further service.

Sincerely,

Leonard C. Slosky
Member, WIPP
Blue Ribbon Panel

B. NEWAL SQUYRES
West One Plaza
101 S. Capitol Boulevard, Suite 1400
Boise, Idaho 83702

May 15, 1990

**VIA FAX 202-224-7970**

The Honorable J. Bennett Johnston, Chairman
Committee on Energy and Natural Resources
United States Senate
Washington, D.C. 20510-6150

Dear Mr. Chairman:

Enclosed are my responses to your follow up questions of April 30, 1990. I appreciated the opportunity to testify before your committee on April 26, 1990, and would be pleased to provide any additional information you need in order to address the issues associated with opening the Waste Isolation Pilot Plant for the test phase.

Very truly yours,

B. Newal Squyres, Member
WIPP Blue Ribbon Panel

BNS/cb

Enclosure

## FOLLOW UP QUESTIONS FROM

## THE UNITED STATES SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

### Modified Waste Forms

**Each of you expressed some concern about the potential need to treat waste or modify the waste form prior to the time that it is placed in WIPP for permanent disposal. As I understand it, each of you generally believe that it will be either necessary or desirable to modify the waste form prior to permanent disposal. Some of you have also stated that it might be appropriate to experiment with some treated or modified waste during the 5-year test phase.**

**1. In your opinion, how far away is the Department of Energy from making decisions on whether to modify the waste form?**

The Engineered Alternatives Task Force has been established to recommend engineered alternatives for the waste form or the facility. This task force recently issued its Recommended Initial Waste Forms for the WIPP Experimental Test Program (May 1990 -- DOE/WIPP 90-0009). I think there is general agreement that some type of waste modification may be appropriate, particularly for waste to be generated in the future. Such decisions should not be made until results are obtained from at least the initial test phase experiments and the Engineered Alternatives Task Force issues its final recommendation in early 1991.

**2. Could these decisions be accelerated?**

I suppose decisions could always be accelerated but I am not convinced that sufficient data exists at this time to make final decisions concerning waste form modification. Again, I believe information from the test phase is necessary in order to make appropriate decisions on this subject.

**3. Would it make any sense to delay the test phase until these decisions are made?**

It makes absolutely no sense to delay the test phase. I agree with Dr. Tom Bahr's statement that "the ultimate selection of a final waste form or redesign of the repository configuration will require data from the test phase."

**4. Would it be feasible and/or appropriate to make some tentative decisions now, or soon, on modifications to the waste form so that experiments could be conducted on modified waste forms during the test phase?**

I believe it is feasible and appropriate to make tentative decisions now on modifications to the waste form and it is my understanding that the bin-scale tests may include modified waste forms.

**5. Could experiments on modified waste forms be conducted in parallel to house experiments already planned for the test phase? Should they be?**

Yes, experiments on modified waste forms can and should be conducted in parallel to experiments already planned for the test phase.

**6. If these experiments were conducted in parallel, would additional volumes of waste be needed or justified? How much?**

I agree with other members of the Blue Ribbon Panel that a reasonable upper limit for the test phase would be one percent of the WIPP waste capacity. This upper limit would provide sufficient flexibility for additional experiments to include modified waste forms for test purposes.

**7. Has the Department looked at the possibility of conducting experiments on more than one waste form during the test phase? If not, should the Department do so?**

Yes, and it is my understanding that this will be done.

**Bin-scale tests**

**1. Where else could these tests be conducted? Is any other DOE facility currently equipped for these tests?**

I do not believe there are any other facilities where bin-scale testing could be started now.

**2. How quickly could facilities be constructed or equipped elsewhere for the bin-scale tests? Approximately how much would it cost to build facilities elsewhere?**

In my opinion, there is no reason to conduct bin-scale tests at any place other than WIPP. Even assuming a suitable facility could be built within a year, one must assume that it would take an additional year, at best, to obtain all the necessary regulatory approvals. DOE has said that construction of such a facility alone would cost in the $20 million range, and this does not include all of the costs associated with achieving regulatory approval. 6437

# APPENDIX III

## Reports to the Secretary of Energy
## Blue Ribbon Panel on the Waste Isolation Pilot Plant

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### REPORT TO THE SECRETARY OF ENERGY

Prepared by Dr. Thomas Bahr
Member, WIPP Blue Ribbon Panel

October 23, 1989

### EXECUTIVE SUMMARY

In August 1989, the Secretary of Energy created a five-member Blue Ribbon Panel (BRP) to provide independent advice on three selected issues to the Waste Isolation Pilot Plant (WIPP). They include:

1. The concept and timing of DOE's proposed WIPP Operations Demonstration (OD) as part of the overall test plan.
2. Whether or not the OD should be conducted in parallel with the Performance Assessment (PA).
3. An evaluation of DOE's validation plan for certification of transuranic (TRU) waste to meet the WIPP Waste Acceptance Criteria (WAC).

**Recommendations:**

1. Full ramp up of the Operations Demonstration portion of the WIPP project should be delayed until results of Performance Assessment testing better clarify the need for possible engineering modifications to drums and/or the repository environment. The OD is, without question, an important element of the WIPP test phase and some limited experience will be gained through

emplacement of waste for test purposes even if full ramp up is delayed. It is possible that an early full ramp up done in parallel with PA testing could later result in having to remove waste if certain engineering modifications are indicated. Removal of this amount of waste for purposes of doing engineering modifications does not represent a particularly difficult task nor should this activity result in any unusual health or safety risks. The primary risk and reason to delay the OD is one of almost certain loss of public confidence in DOE should waste have to be removed.

2. DOE should require full-time waste management inspectors on waste generation lines who report to superiors who are not employed by nor contractors of the waste generation facility. Audits should be more frequent and audit teams should include non-DOE employees, including state agency regulators, who would have appropriate security clearances to witness any operation that generates waste. The non-DOE employees should be more than simply observers but rather an integral part of the overall audit process.

3. DOE should immediately incorporate into its waste certification and validation program provisions to characterize the hazardous RCRA constituents of TRU mixed waste. The waste acceptance criteria should accordingly be modified to incorporate anticipated RCRA permit requirements. The DOE has a long history of dealing with radioactive materials and has developed comprehensive criteria for its safe handling, packaging and transport. In the present day regulatory environment it is absolutely essential for DOE to develop the same capability for the hazardous component of mixed TRU waste regardless of how innocuous it may appear relative to the nuclear hazards of the waste.

4. DOE should incorporate at the WIPP site a capability similar to that at the Idaho National Engineering Laboratory for waste drum assays and expand the capability to enable hot cell inspection of drums, repackaging and waste

retreatment, overpacking and the necessary facilities to examine and characterize the hazardous constituents in mixed TRU waste. DOE should also prepare to embark on a program of new technology development directed at non-destructive qualitative and qauntitative analysis of RCRA constituents. Planning for this effort should be done in close consultation and collaboration with those entities that will ultimately administer the RCRA Part B permit, most notably, the State of New Mexico.

5. DOE should immediately place a high program priority on the management of mixed TRU waste. There should be dual emphasis on characterizing existing mixed waste (see recommendations 3 and 4) and management of newly generated waste for the purpose of better characterizing, minimizing, segregating and perhaps even treating hazardous constituents. DOE should identify "in-house" personnel qualified to develop and implement this program and, if necessary, train, contract with or otherwise acquire the needed team. Administratively, they should be fully integrated into not only the waste management side of the agency but also into those production units that generate the waste.

6. DOE needs to place additional emphasis on generating creative solutions to the long-term containment requirements of 40 CFR 191, particularly in reference to human intrusion scenarios. The reasonableness of assuming that no institutional controls can exist after 100 years should be seriously questioned and DOE should request the National Academy of Sciences or other independent scholarly body to evaluate this issue.

## TEXT

### Introduction:

The Secretary of Energy named a five-member "Blue Ribbon Panel" (BRP) to provide advice on certain aspects of the Waste Isolation Pilot Plant (see Executive Summary). This report was developed over a two-month period and it presents findings and conclusions of a general nature designed to provide broad guidance for DOE's WIPP project. The report does not represent a consensus of the BRP nor should it be construed to be a balanced treatment of opinions held by the many interest groups who have watched the evolution of this project over the years.

The author has been careful to be factually correct but it should be noted that this document has not been reviewed by anyone. Because of the short amount of time for analysis this report should be considered preliminary in nature and subject to further revision after consideration of new information should it become available.

### General Findings:

The DOE WIPP technical team, scientific and engineering contractors and outside evaluators have collectively undertaken what is perhaps the most complex and significant waste management project in this nation's history. Progress on this project over the past decade has indeed been remarkable, especially in view of the fact that nuclear waste disposal is such an emotionally charged issue across the nation. The project is nearing the time when WIPP will receive its first shipment of TRU waste for experimental purposes. This event is seen by many as perhaps the most significant milestone for the entire project. As this date nears, groups who have long opposed the project for various reasons can be expected to become increasingly vocal in their opposition and search for any reason to shut it down. The general public, long aware of this debate, will also give this project more and more scrutiny and opinions are already beginning to take shape. While scientific and regulatory agency review of the soundness of the project will certainly be a factor in public acceptance of WIPP, a more important factor will be the **credibility** of DOE in the eyes of the public.

**Methodology:**

The WIPP BRP first met as a group from September 11-14 to be briefed by DOE officials and to review operations on site at the WIPP, Idaho National Engineering Laboratory (INEL) and the Rocky Flats Plant (RFP). Later in the month on September 24-26 the BRP again met with DOE personnel in Denver to discuss questions submitted by the BRP to DOE. In terms of scope of our contact with DOE we had an opportunity to visit with nearly every decision-making manager that presently has WIPP responsibilities.

**Findings:**

**Observation #1**

The DOE will soon begin a series of tests both in the laboratory and in situ at the WIPP for the purpose of better understanding gas generation and interactions with brine. Bin and alcove experiments, especially if they include performance assessments of different engineering fixes, will be valuable in deciding how final waste emplacement will be accomplished. Until certain test results are in, it will be difficult to determine the need for additional waste treatment and other engineering enhancements required to meet the PA.

**Recommendation #1**

Full ramp up of the Operations Demonstration portion of the WIPP project should be delayed until results of Performance Assessment testing better clarifies the need for possible engineering modifications to drums and/or the repository environment.

**Discussion #1**

The OD is, without question, an important element of the WIPP test phase and some limited experience will be gained through emplacement of waste for test purposes even if full ramp up is delayed. An early full ramp up done in parallel with the PA testing could result in having to remove waste if certain engineering modifications are indicated. Removal of this amount of waste for purposes of retrofitting engineering modifications does not represent a particularly difficult task nor should it result in unusual risk. The primary reason to delay the OD is that of possible loss of public confidence in DOE in the event that waste would have to be removed.

**Observation #2**

The production of nuclear materials by DOE is in large part driven by external factors, most notably the need to fulfill Defense Department needs. As would be expected, careful attention has been given to quality assurance/quality control (QA/QC) programs on production lines because the quality and timely delivery of the final product is essential to this nation's defense. Not only does the Defense Department demand a quality product, but the nation as a whole demands it. In contrast to production of nuclear devices, DOE's management of nuclear waste generated by production is much less influenced by external factors such as meeting the needs of the Defense Department.

**Recommendation #2**

DOE should require full-time waste management inspectors on waste generation lines who report to superiors who are not employed by nor contractors of the waste generation facility. Audits should be more frequent and audit teams should include non-DOE employees, including state agency regulators, who would have the appropriate security clearances to witness any operation that generates waste. The non-DOE employees should be more than simply observers but rather an integral part of the overall audit process.

**Discussion #2**

The observation that QA/QC programs related to waste management are less subject to external forcing influences than production management is not to say that DOE is insensitive to the need for safe management of its waste. Quite the contrary. It is clearly apparent that DOE has devoted much time and effort and has made significant progress in recent years toward this end. This progress is a result of a highly conscientious and professionally administered program of self-regulation. The QA/QC programs for waste certification for the current WAC have been well thought out and with further modifications and fine tuning there is every reason to believe that from a technical standpoint the waste product should be acceptable for transport and ultimate emplacement in the WIPP repository. None-the-less, most of this program and its particular product are self-certified. Opponents to WIPP are well aware of the degree to which DOE self regulates its waste acceptance criteria and the associated QA/QC programs. Public confidence in DOE's ability to manage waste can significantly improve if DOE subjects more of its oversight to outside professionals and regulators, particularly on matters of waste certification and verification.

**Observation #3**

The present version of DOE's waste acceptance criteria seems to have evolved primarily out of concerns for radiological health and safety for workers and transporters and possible radiation exposure to the public. Until only recently, RCRA and its impact on management of TRU mixed waste has been recognized as being relevant to DOE operations. Characterization of the hazardous components of TRU mixed waste is needed for RCRA compliance however, this is difficult to do. What knowledge does exist is based on "process knowledge" and little if any direct verification has been done.

**Recommendation #3**

DOE should immediately incorporate into its waste certification and validation program provisions to characterize the hazardous RCRA constituents of TRU mixed waste. The waste acceptance criteria should accordingly be modified to incorporate anticipated RCRA permit requirements.

**Discussion #3**

The DOE has a long history of dealing with radioactive materials and has developed comprehensive criteria for its safe handling, packaging and transport. In the present day regulatory environment it is absolutely essential for DOE to develop the same capability for the hazardous component of mixed TRU waste regardless of how innocuous it may appear relative to the nuclear hazards of the waste.

**Observation #4**

The present thinking of DOE is to implement a program of self certification at generating sites. This coupled with an effective QA/QC program along with a statistically sound validation program is intended to produce acceptable waste drums ready for loading on TRUPACT's to be transported to an unloaded in the waste handling building at the WIPP. Present plans call for gas sampling from the TRUPACT's for archival purposes, several levels of swab checks for removable contamination, surface dosimetry, cross checks on labeling to verify that the correct drums are on a particular shipment and some other measurements. Not planned at this time are any spot checks using real time radiography (RTR), passive/active neutron assays, drum headspace gas sampling and analysis or any other more rigorous examination to give a final verification of what is in a population of drums on receipt at the WIPP site.

**Recommendation #4**

DOE should incorporate at the WIPP site a capability similar to that at the Idaho National Engineering Laboratory for waste drum assays and expand that capability to enable hot cell inspection of drums, repackaging and waste retreatment, overpacking and the necessary facilities to examine and characterize the hazardous constituents in mixed TRU waste. DOE should also prepare to embark on a program of new technology development directed at non-destructive qualitative and quantitative analysis of RCRA constituents. Planning for this effort should be done in close consultation and collaboration with those entities that will ultimately administer the RCRA Part B permit, most notably, the State of New Mexico.

**Discussion #4**

The final configuration of waste emplacement in the WIPP repository may well require room by room segregation of various waste forms. Tests during performance assessment, particularly those dealing with gas generation, may indicate an advantage in placing similar gas generating drums in the same room to optimize the use of gas "getters" in backfill material. Likewise, it may be found that certain waste forms need to be segregated because of chemical incompatibility, particularly with some of the hazardous components of mixed waste. Should some form of segregation as described above prove to be an important factor in complying with regulatory standards, it would seem prudent to have some form of final verification of waste content before it is "sent down the hole".

The New Mexico EID will soon be the agency to administer the federal RCRA program and they indicate that as a requirement of the Part B Permit they will be required to do sampling for hazardous constituents in the mixed TRU waste at the WIPP site. Such sampling can be a hazardous undertaking and must be approached with great care. Specialized facilities and equipment will be needed and new assay technologies will have to be developed. This would be a significant undertaking yet considering the magnitude of the DOE weapons production program and the investment already made in the WIPP project, tooling up for such a final verification program at the final destination makes sense not only from a comparative economic standpoint but adds another element of safety that could only enhance public confidence in the operations of the DOE.

**Observation #5**

The DOE appears to have done little toward achieving effective administrative coordination between TRU mixed waste management and other elements of the WIPP program.

**Recommendation #5**

DOE should immediately place a high program priority on the management of mixed TRU waste. There should be dual emphasis on characterizing existing mixed waste (see recommendations 3 and 4) and management of newly generated waste for the purpose of better characterizing, minimizing, segregating and perhaps even treating hazardous constituents. DOE should identify "in-house" personnel qualified to develop and implement this program and, if necessary, train, contract with or otherwise acquire the needed team. Administratively, they should be fully integrated into not only the waste management side of the agency but also into those production units that generate the waste.

**Discussion #5**

Organizational realignment is a matter of best left to policy officials in DOE headquarters and the above recommendation is self-explanatory.

**Observation #6**

The long-term performance assessment will require the human mind to predict events 10,000 years into the future. To do so, scientists are put into a position of having to use today's knowledge and technology for developing inexact assumptions and then plug them into a model driven by the exact science of mathematics. To further add to the challenge, the same scientists must assume that all human knowledge of the WIPP site will somehow be lost after 100 years and there will be subsequent human intrusion into the repository.

**Recommendation #6**

DOE needs to place additional emphasis on generating creative solutions to the long-term containment requirements of 40 CFR 191, particularly in reference to human intrusion scenarios. The reasonableness of assuming that no institutional controls can exist after 100 years should be seriously questioned and DOE should request the National Academy of Sciences or other independent scholarly body to evaluate this issue.

**Discussion #6**

Any creditable challenge to a federal rule by a regulatory agency should arise from outside the agency being regulated by the rule. In such an evaluation by the NAS or other scholarly body on this issue it would be important to include representatives from disciplines such as history, philosophy and political science in addition to the "hard" sciences, because this issue is not strictly quantitative.

# WASTE ISOLATION PILOT PLANT
# BLUE RIBBON PANEL

REPORT OF
ROBERT W. BISHOP, ESQ.

MEMBER,
WIPP BLUE RIBBON PANEL

OCTOBER 23, 1989

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ATTACHMENT A

# WASTE ISOLATION PILOT PLANT
# BLUE RIBBON PANEL

## REPORT OF ROBERT W. BISHOP, ESQ.
## MEMBER
## WIPP BLUE RIBBON PANEL

### Executive Summary

The Waste Isolation Pilot Plant (WIPP) Blue Ribbon Panel was established by the Secretary of Energy to advise the Secretary on various aspects of the WIPP program for the disposal of transuranic (TRU) wastes. Specifically, the Blue Ribbon Panel was to advise the Secretary of the Panel members' independent views of the concept and timing of the proposed WIPP Performance Assessment and Operations Demonstration Test Phase and the proposed validation plan for the certification of TRU waste generated at the Department's Rocky Flats Plant.

My observations and recommendations are provided under each of the individual subject headings. My general conclusions appear at the end of each section, and are collected here for the reader's convenience.

### A. WIPP Test Phase: Performance Assessment and Operations Demonstration

An Operations Demonstration is necessary to provide information and experience to enable a determination to be made of whether the WIPP facility, with its associated waste management system, is suitable for use as a permanent disposal facility. Upon satisfying applicable statutory and regulatory responsibilities, and verifiying the operational readiness of the WIPP facility, DOE should immediately commence the Operations Demonstration. TRU wastes must be shipped to support commencement of experiments, using actual waste emplaced in the WIPP facility, which are necessary to support the completion of the WIPP Performance Assessment and to develop practical experience in the operation of the TRU waste management system. The Operations Demonstration should continue after completion of waste emplacement for the experimental program until such time as a determination of the suitability of all aspects of the waste management system operation can be made in accordance with defined acceptance criteria.

### B. Rocky Flats TRU Waste Certification Program Validation Plan

DOE should immediately implement a validation program of the Rocky Flats Plant wastes which have been certified to the WIPP Waste Acceptance Criteria. This should be accomplished by conducting an independent evaluation at the Idaho National Engineering Laboratory, through its Stored Waste Examination Pilot Plant, of a representative random sample of Rocky Flats Plant certified wastes currently in storage in Idaho to verify the contents of those waste packages to the criteria under which those wastes were certified. Concurrently, an audit should be done of the Rocky Flats Plant certification process to evaluate the adequacy of the certification process and to recommend appropriate corrective actions, if any. Both of these programs should be accomplished by experienced operators and quality assurance personnel who have not been previously associated with the Rocky Flats Plant and with the participation, in an advisory role, of designated representatives of each of the states of Colorado, New Mexico and Idaho.

## C. Systems Integration

DOE should establish an administrative mechanism to ensure the interaction of and coordination among the various DOE offices, contractors and subcontractors involved in all aspects of the WIPP program so that coordinated policy decisions can be made with the knowledge of the implications those decisions could have on various aspects of the program and so that those decisions can be implemented in a consistent and timely manner. The recently created DOE WIPP Task Force may be able to accomplish the systems and task integration necessary as long as it is appropriately staffed and given sufficient authority. In addition to DOE Headquarters personnel on the WIPP Task Force, a mechanism should be established, perhaps through topically-oriented Advisory Committees to the Task Force, to assure that the broad perspective of experienced operating personnel at each site and the principal contractors responsible for engineering and technical activities can be evaluated and considered in the decision-making process. The WIPP Task Force should also be responsible for considering and responding to the comments made by reputable groups involved in the WIPP evaluation process (e.g., National Research Council's WIPP Panel, Environmental Evaluation Group) and ensuring that the adoption of appropriate recommendations are implemented in an integrated manner.

## D. Regulatory Requirements

A comprehensive review of all statutory and regulatory requirements applicable to the WIPP program should be conducted to ensure that all requirements are identified and integrated to ensure compliance or the timely preparation of requests for such regulatory exemptions as may be appropriate and technically justifiable because of the unique nature of the WIPP program. This analysis is necessary not only to evaluate the suitability of the WIPP program to begin operations but throughout the duration of the WIPP program as well. A high priority task should be to establish editorial and technical consistency on all substantive matters between the various regulatory submittals that have been prepared.

Fundamentally, both DOE and EPA are responsible for implementing national policy regarding the proper disposal of TRU waste. Neither agency can shirk its statutory responsibilities, but both must recognize that their responsibilities in this area are joint and not severable.

DOE and EPA must ensure, in the context of the WIPP project, that the responsibility for safe, permanent disposal of TRU wastes and the requirements of Parts 191 and 268 are reconciled. It is not in the nation's best interest for TRU waste, safe though it may be in temporary storage, to remain in that state ad infinitum because of a failure of government agencies to work together to develop a facility that can safely, permanently dispose of TRU wastes.

### E. Waste Acceptance Criteria

The WIPP Waste Acceptance Criteria is but one of the criteria to which the waste generators must ensure that the TRU waste is packaged. These requirements should be integrated so that a single certification process that meets all criteria can be conducted and a single, comprehensive waste manifest completed. Ambiguous requirements should be clarified and all related documentation revised accordingly. The need to acknowledge that correct waste management is an important priority must be inculcated at all waste generating sites.

A monitoring system should be installed at WIPP to ensure that the containers as received meet the WAC and RCRA criteria that may be applicable. WIPP should also have the capability to repackage or otherwise disposition any drums received that do not meet the applicable criteria.

### F. Project Documentation

DOE should establish, at a minimum, two Public Document Rooms, one in Albuquerque or Carlsbad, New Mexico, and one in Washington, D.C., in which all documents associated with the WIPP project would be located to facilitate review of those documents by the public, regulatory agencies (both state and federal), and the various DOE offices and their contractors and subcontractors. The WIPP project is an important national effort of great technical and political complexity; it is critical to informed decision-making that documentation of WIPP-related issues be made available for scrutiny.

### G. Continuing Oversight

An independent advisory body, such as the WIPP Blue Ribbon Panel, should be charged with the responsibility of evaluating (1) the response to and implementation of recommendations made by the WIPP Blue Ribbon Panel members which are adopted by the Secretary, and (2) the Rocky Flats Plant waste certification validation plan, once it is developed, and the results of the validation program upon its completion.

Please refer to the associated report for the analysis upon which these conclusions are based.

# REPORT OF ROBERT W. BISHOP, ESQ.
MEMBER
WASTE ISOLATION PILOT PLANT BLUE RIBBON PANEL

## I. WASTE ISOLATION PILOT PLANT BLUE RIBBON PANEL

On August 11, 1989, Secretary of Energy James D. Watkins announced the establishment of a Blue Ribbon Panel to review the plans of the U. S. Department of Energy (DOE) for experiments and operational tests at the Waste Isolation Pilot Plant (WIPP) regarding the disposal of transuranic (TRU) wastes. Specifically, the Blue Ribbon Panel was to be responsible for providing an independent, technical review of WIPP operational issues relating to the concept and timing of the proposed WIPP Performance Assessment and Operations Demonstration Test Phase and the proposed validation of the certification of TRU wastes generated at the DOE Rocky Flats Plant for disposal at WIPP. The Panel consisted of five members: three members were nominated by the Governors of Colorado, Idaho and New Mexico, and two members were appointed by Admiral Watkins. The responsibility of the Panel members was to evaluate the information provided by DOE representatives, contractors and such other individuals and groups as each Panel member might determine appropriate and to each submit an independent report to DOE of our individual conclusions and recommendations, which would then be used as input to DOE's decisions concerning WIPP activities.

The Panel collectively met on September 11-14, 1989, with representatives of DOE and its major contractors and representatives of the National Research Council's WIPP Panel and the Environmental Evaluation Group (an independent advisory group located in Albuquerque, New Mexico). The Panel also toured the WIPP facility and TRU waste-related activities at the Idaho Nuclear Engineering Laboratory in Idaho Falls, Idaho and the Rocky Flats Plant in Jefferson County, Colorado. The Panel met with additional Department and contractor representatives at a meeting on September 25, 1989, that was called by the Panel to discuss questions that Panel members had identified as a result of the tour and associated presentations and the review of additional material that individual Panel members had requested.

Written material was provided to each Panel member, and Panel members were encouraged to request additional information that they thought might be helpful in their evaluation. In addition, Panel members were encouraged to address any questions they might have to representatives of DOE, contractors associated with the WIPP project, the National Research Council's WIPP Panel or the Environmental Evaluation Group. Changes in certain aspects of the project have apparently already occurred based on questions raised by Panel members during the Panel's investigation. Although this is a positive sign, it also means that a number of observations made by the Panel members in their individual reports may no longer accurately reflect the status of that matter.

Attachment A is a listing of resource material that I reviewed, either completely or in part as pertinent to the Panel's Charter, to assist me in my understanding of the WIPP Project and to assist me in formulating the recommendations contained in this report. In addition to responding to the responsibilities delineated in the Panel's Charter, I have offered observations and recommendations on other aspects of the WIPP Project that I thought might be beneficial, based on my experience with nuclear matters over the last twenty-five years.

## II. BACKGROUND

### A. The Waste Isolation Pilot Plant

DOE is responsible for managing radioactive waste from defense activities and programs pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and the Department of Energy Organization Act of 1977. One type of radioactive waste resulting from the production of nuclear weapons is transuranic (TRU) wastes. TRU wastes are materials contaminated with alpha-emitting radionuclides having atomic numbers greater than uranium (i.e., 92) with half-lives longer than 20 years and in concentrations greater than 100 nanocuries per gram. The TRU wastes result primarily from plutonium reprocessing and fabrication, as well as research and development activities at various DOE defense facilities. The wastes exist in a variety of forms, ranging from unprocessed laboratory trash (e.g., tools, glassware and gloves) to solidified sludges from treatment of waste water. Approximately 60% of the TRU wastes also contain hazardous chemical constituents; TRU wastes containing hazardous chemical constituents have physical and radiological characteristics similar to those of TRU wastes that do not contain these constituents. Since 1970, pursuant to a decision of the U. S. Atomic Energy Commission to store TRU waste by methods designed to keep it retrievable for at least 20 years rather than to continue the practice of shallow land burial, TRU wastes have been stored separately from other radioactive wastes produced at defense facilities for permanent emplacement in a geologic repository.

In 1957, a committee of the National Academy of Sciences suggested salt formations as a suitable geologic medium for the permanent disposal of radioactive wastes. Work started in 1975 on a conceptual design for a repository at a site in Eddy County, New Mexico, primarily to dispose of TRU wastes stored in retrievable form at the Idaho National Engineering Laboratory. The disposal facility, denoted the Waste Isolation Pilot Plant (WIPP), was first authorized, and designated as Project 77-13-f, by Public Law 95-183. The Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Public Law 96-164), enacted on December 29, 1979, authorized the WIPP facility "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission."

The WIPP site, located in southeastern New Mexico approximately 26 miles southeast of Carlsbad, New Mexico, encompasses 18,960 acres of semi-arid land, all either federal or state land, of which nearly 17,000 acres would be used for buffer zones around the underground repository area.

In terms of geology, the site is in the north-central part of the Delaware Basin, a region in which evaporation in a shallow sea deposited about 3600 feet of evaporites during the Permian Period 280-225 million years ago. The repository would be excavated from a bed of nearly pure salt in the Salado Formation, which is approximately 2000 feet thick, with a mined disposal level 2150 feet below the surface. Although underground dissolution of salt in the region is still an active process, the rate of dissolution is so slow that the zone of salt considered for the repository is expected to remain unaffected for two to three million years.

In accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), an environmental analysis was done of the WIPP site and a Draft Environmental Impact Statement (DEIS) published in April 1979. The Final Environmental Impact Statement (FEIS) for the WIPP project, which included responses to comments received from the public and other government agencies, was published in October 1980. The preferred alternative delineated in the FEIS was to continue storing TRU wastes at the Idaho National Engineering Laboratory until a repository is available to receive it and to use the Los Medanos site in southeastern New Mexico for the construction and operation of a facility designed for the disposal of TRU wastes.

On January 28, 1981, DOE issued a Record of Decision on the WIPP project pursuant to the regulations of the Council on Environmental Quality (46 Fed. Reg. 9162). In that decision, DOE analyzed the environmental impacts of the authorized WIPP project and the alternatives thereto as identified in the FEIS. DOE determined that the long-term impact on the human environment resulting from taking no action was unacceptable: leaving the TRU wastes in surface storage could lead to very high radiation exposures both to individuals and the general population as a result of possible future volcanic action or human intrusion after governmental entities no longer controlled the site. DOE concluded that the environmental impacts predicted for the use of the Los Medanos site appeared acceptable for long-term disposal of TRU wastes "with minimal risk of any release of radioactivity to the environment. There was no indication that an alternate site for the demonstration would pose reduced risks." It was concluded that use of that site would solve the unacceptable long-term environmental problem of the surface storage of TRU wastes in the shortest amount of time and avoid the inflationary costs attributable to delay in constructing a facility. In conclusion, the Record of Decision stated that "DOE has weighed the benefits of proceeding with the authorized WIPP project against its potential environmental impacts and costs, and after consideration of the benefits, impacts and costs of reasonably available alternatives, has determined to proceed with the phased construction and operation of the authorized WIPP project." Consistent with NEPA requirements, DOE also stated that any significant new environmental information would be reviewed and the decision to proceed with the phased construction and operation reexamined as appropriate.

Construction of the WIPP project at the Los Medanos site commenced in April 1981. A decision to proceed with full facility construction was announced by DOE in June 1983, following conclusion of the Site and Preliminary Design Validation (SPDV) Program.

A draft Supplement to the Environmental Impact Statement (SEIS) was published in April 1989 to update the environmental record established in 1980 by evaluating the environmental impacts associated with new information, new circumstances, and proposed facility modifications from those originally envisioned. The SEIS documented a major modification to the WIPP schedule: WIPP would operate under a "Test Phase" for approximately five years during which time certain tests and operational demonstrations would be conducted.

The purpose of the Test Phase would be to reduce uncertainties associated with the prediction of natural processes that might affect long-term performance of the underground waste repository to assist in the determination of the ability of WIPP to meet applicable federal standards for the long-term protection of the public and the environment. The operational demonstrations would be conducted to evaluate the ability of the TRU waste management system to certify, package, transport and emplace TRU wastes in the WIPP safely and efficiently. Upon completion of the Test Phase, DOE would determine, based upon a performance assessment, whether WIPP would comply with the U. S. Environmental Protection Agency (EPA) standards for the long-term disposal of TRU wastes (i.e., 40 C.F.R. Part 191, Subpart B). If a determination of compliance is made, WIPP would enter a permanent disposal phase of approximately 20 years to demonstrate the safe disposal of TRU wastes. After completion of waste emplacement, the surface facilities would be decommissioned and the WIPP underground facilities would then serve as the permanent TRU waste repository.

## B. Agreements with the State of New Mexico

In April 1981, the State of New Mexico filed suit against DOE concerning the acquisition of additional technical information and resolution of a number of controversial issues. The State of New Mexico's concerns included (1) that the final decision to commence construction and operation of WIPP should not be reached until the results of the SPDV tests were available, (2) that the State of New Mexico be provided with the opportunity to address and resolve off-site state government concerns prior to the decision to commence with construction, (3) that the State of New Mexico be entitled to enter into a binding and enforceable Consultation and Cooperation Agreement with DOE, and (4) that the withdrawal provisions of the Federal Land Policy and Management Act be complied with, including public hearings to be held before decisions were made to withdraw lands from the public domain for the WIPP project. In July, 1981, a Stipulated Agreement was executed by the State of New Mexico and DOE to address these issues. An Agreement for Consultation and Cooperation between the Department of Energy and the State of New Mexico on the Waste Isolation Pilot Plant was executed simultaneously and revised a number of times through April 1988. In December 1982, a Supplemental Stipulated Agreement was executed to address the state's off-site concerns regarding state liability, emergency response preparedness, independent monitoring of WIPP by the State, and upgrading and repair of state highways. A 1987 modification to the Agreement for Consultation and Cooperation limited TRU waste receipt to 15 percent prior to there being a demonstration of compliance with EPA disposal standards contained in 40 C.F.R. 191, Subpart B.

## C. Environmental Evaluation Group

In 1978, the State of New Mexico established the Environmental Evaluation Group (EEG), with funds provided by DOE, to be responsible for conducting an independent technical evaluation of WIPP. The National Defense Authorization Act, Fiscal Year 1989, assigned EEG to the New Mexico Institute of Mining and Technology. Of particular pertinence to the Blue Ribbon Panel's investigation were reports EEG-40, 41 and 42 and EEG's Interim Evaluation of

Quantities of Transuranic Waste to be Brought to WIPP for Performance Assessment and Operational Demonstration, dated July 9, 1989 (Refs. 55-58).

## D. National Research Council

The National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, was asked in March 1978 by DOE to "review the scientific and technical criteria and guidelines for designing, constructing and operating a waste isolation pilot plant for isolating radioactive wastes from the biosphere." An interim report was issued in 1983 and a final report, Review of the Scientific and Technical Criteria for the Waste Isolation Pilot Plant (WIPP), was issued by the National Research Council Commission on Physical Sciences, Mathematics, and Resources' Board on Radioactive Waste Management, Panel on the Waste Isolation Pilot Plant (hereinafter referred to as the "National Research Council's WIPP Panel"), in 1984.

Subsequently, the National Research Council's WIPP Panel was requested to review DOE's draft plan for conducting certain experimental and operational tests (Ref. 8). On July 19, 1989, the National Research Council's WIPP Panel issued its observations and recommendations on that plan.

## E. WIPP Operational Prerequisites

Prior to initiation of the Test Phase, which necessarily involves the emplacement of TRU waste at the WIPP facility, the following actions must be accomplished: (1) land withdrawal, either administrative or legislative, completed; (2) a final Safety Analysis Report for the facility approved; (3) a Resource Conservation and Recovery Act (RCRA) No-Migration Variance Petition granted by EPA; (4) a Certificate of Compliance issued by the U. S. Nuclear Regulatory Commission (NRC) for TRUPACT II (the container in which the TRU waste will be shipped to the WIPP facility); (5) the Supplement to the Final Environment Impact Statement (SEIS) completed and DOE's Record of Decision issued; and (6) the Secretary must determine that the facility is ready to begin operations. Pursuant to the agreements with the State of New Mexico, the facility must also be in compliance with the requirements of 40 C.F.R. Part 191, Subpart A - Environmental Standards for Management and Storage.

Prior to commencement of operations following the Test Phase, the facility must be in compliance with 40 C.F.R. Part 191, Subpart B - Environmental Standards for Disposal, which includes the completion of a performance assessment and other demonstrations of the capability of the facility to meet certain radiological limits for 1,000 years after disposal and for 10,000 years after disposal.

At the time of this report, the following is the status of the required actions: both administrative and legislative land withdrawal proceedings are pending; the final Safety Analysis Report is expected to be issued in late October 1989 and approved in January 1990; the No-Migration Variance Petition was filed in February 1989, and EPA review is expected to be completed in January 1990 and action on the petition is expected in April 1990; the TRUPACT II Certificate of Compliance was issued on August 30, 1989; the final SEIS is scheduled for issuance in mid-January 1990, and the Record of Decision is scheduled to be issued in February 1990. Completion on these activities on this schedule would support a Secretary's decision on WIPP readiness on or about June 1, 1990, and if that decision is to proceed, the facility could begin the Test Phase on or about July 1, 1990.

## III. PROGRAM APPRAISAL

### A. WIPP Test Phase: Performance Assessment and Operations Demonstration

Background

In April 1989, DOE issued its "Draft Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment and Operations Demonstration" (DOE/WIPP 89-011) (hereinafter referred to as the "Draft Plan"). The Draft Plan, and a subsequent Addendum dated June 16, 1989, details the process whereby scientific and technical data will be collected that DOE has determined to be necessary for it to be able to make a decision on whether to designate the WIPP facility as a permanent repository for TRU waste. The Test Phase is described as having two objectives: (1) determination of compliance, through development of a performance assessment, with EPA regulations contained in 40 C.F.R. Part 191, Subpart B, and (2) completion of an operations demonstration to evaluate the safety and effectiveness of the TRU waste management system's ability to emplace TRU waste in the WIPP facility at the designed rate.

The Draft Plan describes a two-part program. Part One covers the first three years and concludes at a holdpoint where results will be evaluated and a determination made whether to proceed with Part Two, which would involve conducting any additional necessary tests. DOE has concluded that, consistent with its goal of minimizing the amount of waste emplaced while still being able to conduct a technically valid operations demonstration, it would limit the amount of waste emplaced in Part One to not exceed 3% of WIPP's capacity. As described in the Draft Plan, this would entail the emplacement of approximately 22,600 drums of contact-handled (CH) waste and three canisters of remote-handled (RH) waste. (CH wastes are those in which the dose rate at the surface of the waste package is not greater than 200 mR/hr; RH wastes are those with a dose rate at the surface of the waste package that is greater than 200 mR/hr, but not greater than 1000 R/hr).

In addition to being evaluated by the WIPP Blue Ribbon Panel, the Draft Plan has also been critically analyzed by the National Research Council's WIPP Panel and the Environmental Evaluation Group.

Observations and Recommendations

#### Performance Assessment

Fundamentally, there appears to be broad consensus that in situ testing with actual TRU wastes is necessary to validate design concepts and models to be used for the Performance Assessment and to complement past, current and future laboratory testing. I concur. The only way in which laboratory simulation and small-scale tests can be determined to provide a reasonable representation of real conditions is to validate them in the actual environment they are meant to simulate. When system performance over a 10,000 year period is to be examined, a critical factor in the analysis is the ability to ascertain and minimize the degree of uncertainty in the calculations. A great deal is known about the geologic formation in which WIPP is located and the characteristics and effects of TRU wastes, but potentially significant uncertainties remain. A major uncertainty is the rate and volume of gases generated as a result of bacterial action, as byproducts of metal corrosion, and as the volatile products of radiolysis. The duration of the time period, and the complexity of chemical and radiological reactions that may occur, require the use of realistic rather than ostensibly conservative estimates because it may be that what were expected to be conservative assumptions are not, in fact, conservative. The planned experiments are not required to demonstrate regulatory compliance but rather to reduce uncertainties associated with the waste form and the response of the physical environment to the emplacement of those wastes.

As to the particulars of the planned laboratory tests, bin-scale tests and alcove tests, their timing, priority and detailed procedures, I have no opinion: the Draft Plan does not detail the purpose, protocol and evaluation process of these tests, but I do not believe it to be appropriate to attempt to definitively establish at a fixed point in time what must by necessity be an evolving, iterative process. For example, significant questions remain concerning the volume and rate of gas generated through decomposition of the wastes and the containers, and the effect of that gas generation on repository performance. It may even be that room-scale tests containing a sufficient volume of TRU waste to ensure homogeneity of the constituents will be necessary to perform an effective experiment.

Under the present schedule, data from some of the experiments (e.g., those associated with different types and configurations of backfill material) will not be available in time to support the Performance Assessment development. I do not believe that is a fundamental flaw in the Test Phase, because the regulatory criteria may be able to be satisfied without the need to adopt engineering enhancements which might otherwise be desirable. Those enhancements may be as simple as segregating the drums, based on their content codes, to separate nitrogen-generating wastes from those that will generate primarily hydrogen and carbon dioxide. Or, it may be that all of the wastes emplaced during the experimental program and the operations demonstration (which could be as much as 165,000 cubic feet), and all of that currently in storage (approximately 2,300,00 cubic feet), may have to be unpacked, treated in some way, and repacked with attendent costs and occupational exposures. These effects could be massive. The experimental program can provide valuable results regarding the potential benefit or detriment associated with various engineering enhancements or waste form modifications that may be determined to be necessary to meet facility criteria. If regulatory criteria cannot be satisfied without those enhancements, a decision must be made at that time regarding those modifications which should be instituted. Additional experiments may need to be conducted, based on those enhancements having been implemented, to be able to justify facility operation.

The experimental program appears to be well thought-out and should result in the achievement of two complementary goals: the validation, or modification as may be appropriate, of the understanding of the chemical, radiological, and geological phenomena of import to this project; and the reduction of uncertainties in the evaluation of the project's ability to meet the required criteria. However, DOE should describe the uncertainties that each test is designed to address and when results are anticipated to be available. The key is to ensure that the tests are designed to reduce the uncertainties associated with the critical parameters. These experiments should begin as soon as possible to provide the maximum amount of useful data to support the conduct of the Performance Assessment and to evaluate what engineering enhancements or additional experiments, if any, may be necessary or desirable.

I fully expect the experimental program to generate data that will help to narrow the analytical uncertainties associated with the project, and it may well suggest the need for further experiments in an iterative fashion to provide data necessary to support a decision of whether the WIPP facility is suitable for operation. Although I appreciate the need to establish some reasonable parameters, I would strongly resist the imposition of definitive limits which would preclude the flexibility necessary to ensure that the experiments are properly conducted and result in the most meaningful data. At this point, it is impossible to know when enough will be known regarding waste and repository performance. I do not believe that the Nation has the luxury of waiting until we know all that we wish we knew about everything that could affect this project.

## Operations Demonstration

The Operations Demonstration is characterized in the Draft Plan as that portion of the Test Phase which begins at the conclusion of the shipments necessary to support the experimental program and ends with a period of demonstrated capability to handle and emplace waste at the facility's design rate of 60 shipments per month.

In fact, the Operations Demonstration portion of the Test Phase really begins with the shipment and receipt of the first shipment of TRU waste for the experimental program. Shipments of waste for the experimental program will be made from both the Rocky Flats Plant and the Idaho National Engineering Laboratory and thus will provide the first practical experience of the operation of the TRU waste management system. Consequently, I do not consider the Test Phase to have a segregatable segment entitled the Operations Demonstration; rather, I would separate the Operations Demonstration into two phases. The first phase would consist of the management and emplacement of TRU wastes necessary to conduct the experiments to support the development of a viable Performance Assessment (including those wastes that may be necessary to support alcove or room-scale tests that may be determined to be necessary), with the second phase being such additional shipments as may be necessary to further evaluate the waste management system and facility operation.

Regarding the conduct of the Operations Demonstration, criteria should be established for each phase of the waste management system operation whereby it can be concluded, when the criteria is met, that no further experience in that phase is necessary. Although RH wastes comprise a small fraction of the total amount of TRU waste and shipments, I believe that a demonstrated capability to safely handle RH waste should be a prerequisite to the Secretary's decision of operational readiness of the facility. It would be a mistake to wait too long to derive experience with the waste management system such that any modifications would end up being on the critical path for WIPP operation, but it would also be a mistake to completely staff and train personnel to be able to handle full system design through-put and be forced to have that trained cadre wait months or years from their time of training and operational experience until the repository begins full-scale operation.

After the initial campaign of shipments necessary to support the experimental phase, it should be determined what, if any, and when additional experience is necessary to accomplish the independent purpose of waste management system operational viability. Achieving the right balance should be the responsibility of operating personnel on an iterative basis, with the ramp-up rates of the number of shipments adjusted accordingly, as developments affecting the facility's schedule occur. Within the constraint of the 3 percent of the WIPP facility volume now specified in the Draft Plan, there is an ample margin for sufficient wastes to be transported to demonstrate the viability of the system. This would include such additional amounts as may be appropriate to validate the system after modifications to the system have been made as a result of lessons learned from earlier experience.

The relatively small volume associated with a maximum amount of waste that would be emplaced under the Draft Plan (i.e., 3 percent) is not likely to cause a significant perturbation in facility long-term performance if the results of the experiments lead to a determination that the wastes to be emplaced at WIPP (and perhaps only the 97 percent of the wastes that had not yet been emplaced in WIPP at that point) must be modified, segregated, repacked or in some other way managed to meet the applicable performance criteria. All of the wastes emplaced as part of the Operations Demonstration that are not associated with the experiments will not be backfilled -- thus, the wastes could be reconfigured for segregation purposes and/or backfill material added even once the waste was emplaced. This would further reduce the likelihood that those wastes would have to be retrieved.

Retrieval of the wastes emplaced, whether required for waste reconfiguration and/or the addition of engineering enhancements or because a determination is made that WIPP is not a suitable disposal facility, can be accomplished if necessary. This has been demonstrated by the performance of a very well-planned and executed mock retrieval exercise that validated the ability of the facility to retrieve emplaced wastes (Ref. 59). It has been estimated that the costs of retrieval for the full amount of the wastes emplaced in the Operations Demonstration (i.e., up to 3 percent) would be in the range of $1 million. Concurrent with the development of the criteria that will be used to determine what waste management experience beyond that associated with the experimental program is needed, DOE should develop a contingency plan on how and where it would deal with wastes that might have to be retrieved after having been emplaced as part of the Operations Demonstration, including those wastes associated with the experimental program.

The decision of how much experience in waste system management is necessary beyond that gained with the wastes emplaced for the experimental phase is, at heart, a risk/benefit equation. It is my conclusion that the risk, both in terms of cost and occupational radiation exposure for emplacing wastes up to the 3 percent maximum, are reasonably balanced against the benefit of ensuring that the system works in a timely fashion. Any necessary modifications can be made in time to support facility operation. I believe the 3 percent limit established in the Draft Plan is not unreasonable, but that the decision should be made, and periodically reconsidered, by operating personnel as to how much experience (in addition to that gathered in the experimental phase) is necessary and appropriate, up to the 3 percent limit. The fundamental decision should be how to gain the maximum experience, at the opportune time, with the minimum amount of waste. The waste volume utilized should be as small as possible so that the cost, both economic and in terms of human resources, of retrieval is as small as possible if it is subsequently determined that the wastes must be repackaged or that the WIPP project is not viable, but the waste volume must be large enough to validate system operability. It should not be arbitrarily set in advance but rather be the responsibility of the WIPP management staff to accomplish on a timely basis against the criteria established in advance. Evaluating performance against criteria of acceptability determined in advance is a good management practice.

## General Conclusion

An Operations Demonstration is necessary to provide information and experience to enable a determination to be made of whether the WIPP facility, with its associated waste management system, is suitable for use as a permanent disposal facility. Upon satisfying applicable statutory and regulatory responsibilities, and verifying the operational readiness of the WIPP facility, DOE should immediately commence the Operations Demonstration. TRU wastes must be shipped to support commencement of experiments using actual waste emplaced in the WIPP facility which are necessary to support the completion of the WIPP Performance Assessment and to develop practical experience in the operation of the TRU waste management system. The Operations Demonstration should continue after completion of waste emplacement for the experimental program until such time as a determination of the suitability of all aspects of the waste management system operation can be made in accordance with defined acceptance criteria.

## B. Rocky Flats Plant TRU Waste Certification Program Validation Plan

### Background

Consistent with the WIPP Waste Acceptance Criteria (WAC), each DOE facility that generates TRU waste is required to establish its own waste certification program and associated quality assurance plan. Particular questions have been raised concerning the validity of the waste certification program conducted at the Rocky Flats Plant, and that concern was heightened by a Federal Bureau of Investigation (FBI) search of that facility begun on June 16, 1989, as part of a U. S. Department of Justice investigation.

Evaluation of a validation plan of the Rocky Flats Plant certification program was one of the primary responsibilities assigned to the WIPP Blue Ribbon Panel.

At the Panel's meeting with DOE and contractor representatives in Idaho on September 13, 1989, a proposed validation plan was discussed. At the Panel's subsequent meeting held on September 25, 1989, it became clear that the proposed validation plan was designed to evaluate the Rocky Flats Plant certified wastes to criteria other than those used in the certification process at Rocky Flats Plant and thus was preordained to conclude that the Rocky Flats certification program was inappropriately executed. Consequently, it would not satisfy the goal of determining whether the Rocky Flats Plant certification process had been correctly performed. An alternative validation plan was received on October 19, 1989, which was too late for the detailed evaluation and interaction with staff that such an important matter requires.

## Observations and Recommendations

The primary purpose of the validation plan should be to determine whether the Rocky Flats Plant certification program was correctly administered and that the wastes evaluated in accordance with that program were correctly certified. Whatever validation program is adopted, it should have the following attributes: (1) it should be conducted by independent, technically qualified personnel in such a manner as to minimize occupational exposure, both to the radiological and the hazardous constituents contained within the waste drums; (2) it should be planned so as to minimize costs and system disturbance; (3) it should avoid additional transportation of the wastes if possible; (4) it should minimize the generation of additional wastes during the conduct of the validation program; (5) it should be conducted in a timely fashion to remove the cloud of suspicion associated with the Rocky Flats Plant certification program, or, if the program were flawed, to be able to identify discrepancies so that they can be corrected in a timely fashion; and (6) it should be conducted with comparable equipment calibrated to equivalent standards so as not to invalidate the Rocky Flats Plant certification program merely because of advances in technology that have occurred since the time those wastes were certified.

Separately, there may be value in reexamining, with currently available, more sensitive equipment, wastes previously certified by the Rocky Flats Plant and those wastes certified prior to the change in the concentration criteria of TRU wastes from 10 nanocuries per gram to 100 nanocuries per gram in accordance with DOE Order 5820.2A. It appears likely that a significant amount of the waste determined to be TRU waste could, in accordance with the revised criteria, be appropriately classified as either low-level radioactive waste, hazardous waste or mixed waste (rather than TRU or TRU-mixed waste). It may be possible to accomplish this reanalysis at the same time the validation program of the Rocky Flats Plant certification process is undertaken, but the purpose of the different evaluations should not be compromised. The purpose of the validation program is to determine whether the Rocky Flats Plant certification program was correctly administered, whereas the purpose of the second program is be to evaluate the waste with more sensitive equipment and to different criteria. The two programs may be able to be applied simultaneously, but the results should be separately evaluated.

Further, the implementation of either of these programs may provide a reasonable opportunity to evaluate the hazardous constituents within the TRU waste. That analysis can be very important to verify the process knowledge otherwise used in determining the presence and amount of hazardous constituents in the TRU waste and may provide empirical data that could be very important to the completion of the Performance Assessment and the No-Migration Variance Petition. I do not advocate the opening of a large number of containers merely to conduct this analysis, but an evaluation should be undertaken of an appropriate sample size and sampling technique that could provide additional, and probably very important, data while minimizing the exposure to these materials to the individuals conducting the evaluation. Use of available technology (e.g., head gas sampling evaluated by gas chromatography/mass spectrometry) and techniques could significantly reduce personnel exposures while ensuring that the wastes are properly characterized.

### General Conclusion

DOE should immediately implement a validation program of the Rocky Flats Plant wastes which have been certified to the WIPP Waste Acceptance Criteria. This should be accomplished by conducting an independent evaluation at the Idaho National Engineering Laboratory, through its Stored Waste Examination Pilot Plant, of a representative random sample of Rocky Flats Plant certified wastes currently in storage in Idaho to verify the contents of those waste packages to the criteria under which those wastes were certified. Concurrently, an audit should be done of the Rocky Flats Plant certification process to evaluate the adequacy of the certification process and to recommend appropriate corrective actions, if any. Both of these programs should be accomplished by experienced operators and QA personnel who have not been previously associated with the Rocky Flats Plant and with the participation, in an advisory role, of designated representatives of each of the states of Colorado, New Mexico and Idaho.

## C. Systems Integration

### Background

Early in the Panel's investigation, it became obvious that there was an institutional lack of communication among the various DOE offices involved in the WIPP project and the various contractors who were tasked with specific work product responsibilities by those offices. Examples abound and range from the inconsequential to the very consequential. For instance, operating personnel at the Rocky Flats Plant had not informed those individuals responsible for conducting the WIPP Performance Assessment about the nature of compaction to be accomplished at the Rocky Flats Plant; the compaction of the TRU wastes could directly affect criticality and gas generation calculations, both of which are critical parameters in evaluating WIPP facility performance.

## Observations and Recommendations

At best, this results in an inefficient way to address significant problems, particularly when dealing with issues of a complex nature associated with a major project like the WIPP project. Frequently the result can be counterproductive activity. An additional deleterious result can be the lack of cross-fertilization between professionals and the resulting lack of different perspectives and insight which could hamper the development of innovative solutions to problems. In my judgment, the WIPP project and its associated waste management system cannot be managed correctly if engineering, technical and operating personnel are not responsible for interacting frequently with each other and with DOE staff. It is encouraging that DOE has recently established an interdisciplinary WIPP Task Force to oversee WIPP-related activities, and I advocate that it be provided with the responsibility, and sufficient authority, to ensure that the integration of these important activities occurs promptly.

In addition, there does not appear to be any on-going process to take advantage of the insight provided by independent groups evaluating aspects of the WIPP project or to respond to comments made at Congressional hearings (e.g., Ref. 10) and other types of relevant communications. This is not to imply that the observations and recommendations of the National Research Council's WIPP Panel, the Environmental Evaluation Group or even of the Blue Ribbon Panel itself should be blindly adopted, or categorically rejected either. There is evidence that at least some of these reports have been evaluated (e.g., Ref. 50). However, there does not seem to be an established policy that such a review and analysis should always be conducted. A mechanism should be established for those observations and recommendations to be carefully considered -- by technical, engineering and operating personnel, and staff who have policy perspective and responsibility -- for the value that such independent insights might provide. The results of those evaluations should be documented and a response provided to the issuing organization.

The WIPP project has completed its construction phase and now is poised to begin operations under the Test Phase. Therefore, a start-up team should be assembled, perhaps under the auspices of the WIPP Task Force, to ensure that the necessary transition is accomplished in a coordinated fashion (e.g., ensuring that all documents and plans reflect the as-built configuration). The team should be headed by an individual with major project start-up experience and include representatives of the Albuquerque Operations Office, the WIPP Project Office, the DOE Office of Environmental Safety & Health, the DOE Office of General Counsel, and operations personnel from the waste generating sites. This group must also have the authority commensurate with its responsibilities to ensure the safe and timely commencement of operations under the Test Phase.

## General Conclusion

**DOE should ensure that coordination takes place among the various DOE offices, contractors and subcontractors involved in all aspects of the WIPP program so that coordinated policy decisions can be made with the knowledge of the implications those decisions could have on various aspects of the**

program and so that those decisions can be implemented in a consistent and timely manner. The recently created DOE WIPP Task Force may be able to accomplish the systems and task integration necessary, as long as it is appropriately staffed and given sufficient authority. In addition to DOE Headquarters personnel on the WIPP Task Force, a mechanism should be established, perhaps through topically-oriented Advisory Committees to the Task Force, to assure that the broad perspective of experienced operating personnel at each site and the principal contractors responsible for engineering and technical activities can be evaluated and considered in the decision-making process. The WIPP Task Force should also be responsible for considering and responding to the comments made by reputable groups involved in the WIPP evaluation process (e.g., National Research Council's WIPP Panel, Environmental Evaluation Group) and ensuring that the adoption of appropriate recommendations are implemented in an integrated manner.

## D. Regulatory Requirements

### Background

EPA regulations contained in 40 C.F.R. Part 191, Subpart A - Environmental Standards for Management and Storage, and Subpart B - Environmental Standards for Disposal, which were adopted in 1985, are the fundamental regulatory requirements that the WIPP facility must meet. The requirements of Subpart A are also mandated as a condition of the Stipulated Agreement between DOE and the State of New Mexico. Basically, Subpart A imposes a requirement that DOE operate the facility such as to provide reasonable assurance that the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 mrem to the whole body and 75 mrem to any critical organ. Subpart B establishes individual protection requirements such that any member of the public in the accessible environment will not, for 1,000 years after disposal, receive a dose to exceed 25 mrem to the whole body or 75 mrem to any critical organ from the undisturbed performance of the disposal system and containment requirements for cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal, with associated assurance requirements. Although disposal facilities are required to install permanent markers, records, and other passive institutional controls to indicate the danger of the wastes disposed of and their location, no contribution from active institutional controls for more than 100 years after disposal may be assumed in the analysis.

Subpart B requires that a performance assessment be conducted, which is an analysis that identifies the processes and events that might affect the disposal system, examines the effects of these processes and events on the performance of the system and estimates the cumulative releases of radionuclides caused by all significant processes and events, considering all associated uncertainties. Those estimates are then incorporated into an overall probability distribution of cumulative release that is measured against the EPA criteria. The EPA standards, both in the regulations, in the supplementary information associated with the final rule, and in the Draft Environmental Impact Statement associated with the final rule, are replete with qualifications associated with the lack of specificity and technical justification because of the long time periods involved and the very nature of the events and processes that can take place during that time which create substantial uncertainties in projecting, and attempting to assure, system performance. In recognition of those uncertainties, both Subpart A and Subpart B contain provisions allowing for the issuance of alternate standards or substitute provisions, based upon appropriate analysis and explanations, as may be necessary to achieve the goals of the regulations. It is not clear whether legal analysis has been undertaken and advice provided regarding interpretation of the regulatory requirements and their application to the WIPP facility, as well as possible courses of action available.

## Observations and Recommendations

It is possible, notwithstanding the best efforts of the most competent professionals available, that a demonstration of the ability of the facility to meet these criteria cannot be justified with the requisite level of certainty. EPA's own analyses demonstrate that a bedded salt formation is clearly a preferable geologic repository for radioactive waste, and the WIPP facility has attributes superior to those analyzed by EPA in reaching that conclusion.

It is also clear that the Part 191 requirements were based primarily on an analysis of the radiological constituents and waste forms associated with high-level radioactive waste. Because of the unique characteristics of TRU waste and because the WIPP facility is located in what EPA has determined to be a geologically superior type of formation, EPA should be closely involved in the experimental program and the development of the Performance Assessment to assure that the data collected and analyses performed satisfy EPA, both with respect to the established criteria and to the development of technical justification that may be required for seeking administrative modification of those requirements as may be appropriate for the WIPP facility. As the National Research Council's WIPP Panel observed, "[t]he primary goal of 40 CFR 191 is to ensure that a repository poses no significant health risk to the public; the standards set for compliance represent EPA's best estimate of what is required to achieve this goal. To date, however, these standards have never been applied to a specific repository." (Ref. 49, App. B). The National Research Committee's WIPP Panel further stated that "[t]he Panel believes that the above-mentioned primary goal can best be achieved by focusing performance assessment activities on demonstrating that the WIPP repository will be safe, i.e., pose no significant risk to the public health and safety, rather than by an uncritical, formal adherence to compliance with the current EPA standard" (emphasis in original). I agree.

Because approximately 60% of the TRU waste to be emplaced at WIPP contains hazardous wastes regulated under the Solid Waste Disposal Act, the Resource Conservation and Recovery Act of 1976, and the Hazardous and Solid Waste Amendments Act of 1984, the provisions of 40 C.F.R. Part 268 must be addressed. These regulations provide, inter alia, that a petition must be filed with EPA "demonstrating, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit . . . for as long as the wastes remain hazardous." Such a petition, commonly referred to as the

"No-Migration Variance Petition," was filed in February 1989. As was recommended for addressing Part 191 requirements, DOE should work closely with EPA to address Part 268 requirements and ensure that the application of those requirements to the WIPP facility is justifiable in terms of the unique nature of the TRU wastes being disposed of at WIPP and because of the fundamental purpose of the WIPP program.

The WIPP Final Safety Analysis Report (FSAR) and the Supplement to the Environmental Impact Statement (SEIS) also address environmental issues. Because of the evolutionary nature of the WIPP project, and particularly the developing understanding of the physical phenomena and geologic characteristics associated with the WIPP facility in the recent past, many of the documents that have been prepared and issued to address a variety of statutory and regulatory requirements (including the FSAR, SEIS and No-Migration Variance Petition) do not accurately reflect the current knowledge; they are being evaluated on the basis that they correctly represent the facts, yet they are different in significant respects (e.g., the assumptions associated with and the evaluation of consequences of hazardous chemical releases). Many of these documents were prepared by different individuals or groups to satisfy specific requirements and it appears that there was, and potentially still is, little interaction between those groups, which only exacerbates the problem.

## General Conclusions

A comprehensive review of all statutory and regulatory requirements applicable to the WIPP program should be conducted to ensure that all requirements are identified and integrated to ensure compliance, or timely requests are prepared for such regulatory exemptions as may be appropriate and technically justifiable because of the unique nature of the WIPP program. This analysis is necessary not only to evaluate the suitability of the WIPP program to begin operations but throughout the duration of the WIPP program as well. A high priority task should be to establish editorial and technical consistency on all substantive matters between the various regulatory submittals that have been prepared.

Fundamentally, both DOE and EPA are responsible for implementing national policy regarding the proper disposal of TRU waste. Neither agency can shirk its statutory responsibilities, but both must recognize that their responsibilities in this area are joint and not severable. DOE and EPA must ensure, in the context of the WIPP project, that the responsibility for safe, permanent disposal of TRU wastes and the requirements of Parts 191 and 268 are reconciled. It is not in the Nation's best interest for TRU waste, safe though it may be in temporary storage, to remain in that state ad infinitum because of a failure of governmental agencies to work together to develop a facility that can safely, permanently dispose of TRU wastes.

## E. Waste Acceptance Criteria

### Background

The WIPP Waste Acceptance Criteria (WAC) establish limits for the physical, radiological, and chemical composition of the TRU waste that is to be emplaced at the WIPP facility. The primary objectives of the WAC are to ensure that all TRU wastes are packaged so that handling and subsequent disposal are performed safely and that the repository is able to isolate the waste from the environment in accordance with regulatory requirements. These criteria were developed so that TRU waste generators could design their waste processing systems such that the waste packages will be acceptable for geologic disposal in an embedded salt environment.

The WAC is established and administered by the Waste Acceptance Criteria Certification Committee (WACCC). In addition to establishing and modifying the WAC as it may deem appropriate, WACCC is responsible for reviewing and approving certification plans and associated quality assurance plans at all TRU waste generating and storage sites. WACCC is also responsible for conducting field audits to ensure that plans and programs associated with WAC are properly implemented. The WACCC is comprised currently of seven individuals, one of whom is required by the WACCC charter to have a formal QA background. All members of the WACCC are associated with the WIPP project: none of the waste generating facilities are directly involved in the formulation or modification of the WAC or the policies of the WACCC other than through applying to the WACCC for approval of their certification process and for supporting an annual audit conducted by the WACCC.

The WAC was developed from the perspective of disposal facility constraints. Different, and in some cases more stringent criteria, must be applied to the waste to meet the requirements of the TRUPACT II waste container, the U. S. Department of Transportation (DOT) and EPA regulations, and regulations of the State of New Mexico (e.g., no hydrogen generation limit vs. no more than 5 percent generated in a 60 day period; no criteria for flammable organics vs. 500 parts per million). For example, there apparently is a significant volume of TRU wastes that are certified to the WAC but do not meet the TRUPACT II criteria. Further, there is no evidence that the limitations imposed by the agreements with the State of New Mexico have been recognized in the WAC. (See Ref. 12, page 5).

### Observations and Recommendations

I have a number of observations concerning the WAC and its implementation. First, the various criteria imposed (e.g., WAC, DOT and EPA regulations, TRUPACT II) should be integrated into a single set of criteria and a comprehensive data collection form developed that would satisfy all applicable requirements. Further, it does not appear that the need to determine the presence and amount of hazardous constituents has been evaluated from either a technical (i.e., to support the Performance Assessment development) or legal perspective. The WACCC should ensure that the appropriate data is collected during the certification process to support a determination that the criteria had been complied with (e.g., sampling the drum head space for volatile organic compounds to ensure that the hazardous waste constituents are properly characterized to comply with EPA requirements). Second, there appears to be very little communication between waste generators, who might be able to learn from one another's experience, and those individuals who are involved in other aspects of the WIPP project (e.g., the scientists and engineers conducting the Performance Assessment); a result is that the interpretation given to the WAC by the WACCC may be dramatically different than that assumed by other individuals associated with the WIPP project. Third, whenever changes are made to the WAC or to the implementation of the WAC (e.g., the conclusion to allow, as a matter of course, free liquids up to 1 percent by volume), they must be immediately communicated to the individuals responsible for conducting the Performance Assessment and to those individuals who are responsible for assuring that the facility meets applicable regulatory requirements. Fourth, there are a number of instances where the criteria established in the WAC, and accompanying QA criteria, include phrases such as meeting "applicable" requirements without any guidance on how that determination should be made, by whom, and in reference to what. Fifth, various of the guidance documents appear to be internally inconsistent (e.g., Ref. 36 relies in its analysis on the use of a corrosive-resistent inner liner to satisfy the pertinent criteria, yet in Ref. 37 the use of corrosion-resistent liners is only recommended; Ref. 36 concludes that radioactive mixed wastes will be packaged, transported and disposed of in a manner "more stringent than regulations applying to other types of toxic substances," yet no technical justification is given for that conclusion: that issue is subject to considerable doubt, which is the focus of the petition filed with the EPA under Part 268). Sixth, there are a number of specific provisions that suggest additional consideration should be given to revising the WAC to include experience garnered to date (e.g., the requirement that labels be affixed to individual waste packages does not require that the labels be located in a manner that would aid in the quality assurance, transportation, receipt and emplacement operations -- for example, requiring labels to be located on the top and bottom and 120 degrees apart on the exterior sides of the drum). These are not critical issues, but they can have a dramatic effect on the ability of the program to function smoothly.

With respect to the operations of the WACCC, I have the following observations. First, once the WAC is established, the WACCC functions primarily in a quality assurance (QA) role, yet only one of its members is required to be experienced in QA activities and there is no requirement for any of the WACCC members to have operational experience. Second, it does not appear that the WACCC, in its QA role, is independent of line management, which experience suggests is a necessary attribute to ensure the independence of QA-related conclusions. Third, the audits of the generating facilities are conducted annually on an announced basis; experience suggests that more valuable audit insight could be achieved by conducting unannounced audits at a random frequency. Fourth, there apparently has not been any effort by the WACCC to evaluate trends that may be present in the individual site certification processes to be able to determine equipment degradation or any programmatic or personnel weaknesses; under the current system, a significant number of records are not required to be retained past a subsequent WACCC audit, nor is there any intent to retain package-specific records (e.g., routine assays and inspections, non-conformance reports) post-emplacement that might facilitate problem resolution if one were to occur during facility operation.

In addition, I would make the following general observations. First, each site apparently develops its own three-digit "content code." It would seem to facilitate quality assurance activities, as well as waste emplacement and possible retrieval, for a uniform set of content codes to be developed for the general categories that are not likely to change and for each site to have the ability to use a defined block of numbers for any necessary additional site-specific content codes. Finally, DOE Order 5820.2A requires that radioactive and mixed wastes be managed in a manner that minimizes the generation of such wastes, yet it is apparent that little thought has been given at the Rocky Flats Plant, and presumably at other DOE production facilities, to conducting their operations in a manner that would minimize radioactive and mixed waste generation and would manage whatever wastes are generated in an integrated manner to minimize the handling of these materials; systems integration is clearly necessary if DOE's goal of effective waste management are to be achieved.

As currently envisioned, there would be no receipt inspection of TRU waste packages at WIPP other than a visual inspection for external package deterioration and both a radiation and surface contamination survey. Thus, once the wastes have been packaged and certified, there would be no further evaluation conducted (e.g., to determine if void spaces were created due to settling during transit; to determine if condensation during storage resulted in an increased amount of free liquid) even though conceivably these wastes could have been in surface storage for up to 20 years. This may not meet RCRA requirements. Further, the WIPP facility's only current capability to treat waste drums that are found to be not acceptable upon receipt is to overpack them.

## General Conclusions

The WIPP Waste Acceptance Criteria is but one of the criteria to which the waste generators must ensure that the TRU waste is packaged. These requirements should be integrated so that a single certification process that meets all criteria can be conducted and a single, comprehensive waste manifest completed. Ambiguous requirements should be clarified and all related documentation revised accordingly. The need to acknowledge that correct waste management is an important priority must be inculcated at all waste generating sites.

A monitoring system should be installed at WIPP to ensure that the containers as received meet the WAC and RCRA criteria that may be applicable. WIPP should also have the capability to repackage or otherwise disposition any drums received that do not meet the applicable criteria.

## F. Project Documentation

Observations and Recommendations

In the course of the investigation by the Blue Ribbon Panel, individual Panel members requested a number of documents that were referenced in other project-related documents or were otherwise pertinent to this investigation. In my experience, DOE and contractor personnel were, without exception, very willing to supply all documents requested. However, with the best of intentions, it frequently became a laborious process to locate where certain of the documents resided so that copies or excerpts could be made. The difficulty of that task strongly suggests that many of the documents that could be helpful to various DOE offices and contractors themselves in pursuing specific topics were not readily available to them and, in fact, they may not have known of their existence or how to obtain them if their existence was identified.

In a similar fashion, the need for individuals or groups not directly responsible for the WIPP project (e.g., National Resource Council's WIPP Panel, Environmental Evaluation Group) and regulatory agencies whose responsibilities affect the WIPP project (e.g., EPA, DOT, NRC), to say nothing of interested members of the media and general public, could be beneficially addressed by having all applicable documents collected in a central location. This would also be advantageous to DOE offices and contractors directly involved in WIPP and to DOE offices and contractors, as well as other regulatory agencies, involved in other projects (e.g. the high-level radioactive waste disposal facility to be developed in accordance with the provisions of the Nuclear Waste Policy Act of 1982) that might benefit from the knowledge of the lessons learned through the course of the development of the WIPP project.

General Conclusion

DOE should establish, at a minimum, two Public Document Rooms, one in Albuquerque or Carlsbad, New Mexico, and one in Washington, D.C., in which all documents associated with the WIPP project would be located to facilitate review of those documents by the public, regulatory agencies (both state and federal), and the various DOE offices and their contractors and subcontractors. The WIPP project is an important national effort of great technical and political complexity: it is critical to informed decision-making that documentation of WIPP-related issues be made available for scrutiny.

## G. Continuing Oversight

Observations and Recommendations

The total time in which the WIPP Blue Ribbon Panel has been involved in conducting its investigation and evaluation has been very limited, primarily because of the necessity of DOE to have the ability to analyze the Panel members' insight in a timely fashion and to implement such modifications to the WIPP program as DOE may deem appropriate based upon that insight. Because

Panel members were, by the press of available time and resources, unable to have all of their inquiries pursued to resolution, it may be beneficial to provide the Panel with an additional opportunity to meet with DOE and contractor rerpresentatives at some time in the future to address the Panel members' observations and recommendations. It may also be beneficial for DOE to have an opportunity to interrogate individual Panel members to ensure that their views are understood. In addition, there may be benefit to DOE for the Panel members to consider their colleagues' analyses and reports and determine if, based on that further insight, additional or modified recommendations could be made that may be helpful to DOE.

As described in Section I of this report, one of the defined responsibilities of the Panel was to evaluate and comment upon a proposed validation plan of the Rocky Flats Plant certified waste program. In that a validation plan has not yet been developed, the Panel cannot at this time satisfy that responsibility. However, the Panel member's several observations and comments on the recent draft plan (Ref. 69) may assist DOE in developing an appropriate validation plan. Once a plan is developed and implemented, there may also be advantage to having an independent body, such as the Blue Ribbon Panel, evaluate the results of the validation program to assist DOE in determining what, if any, additional actions would be appropriate with respect to the Rocky Flats Plant certified waste or certification program.

## General Conclusion

An independent advisory body, such as the WIPP Blue Ribbon Panel, should evaluate (1) the response to and implementation of recommendations made by the Panel members which are adopted by the Secretary, and (2) the Rocky Flat Plant waste certification validation plan, once it is developed, and the results of the validation program upon its completion.

## IV. OVERALL OBSERVATIONS

The WIPP facility appears to have been well-planned and constructed, and the pride of the individuals responsible for those tasks was evident. It has the hallmarks of a professionally designed and staffed facility. It is well-maintained, organized to have a low ambient noise level and operated in a consistent manner, and is designed to provide sufficient space for planned operations with extra space to facilitate dealing with unexpected situations or subsequent system modifications that may be required.

Even in the short time in which the Panel has been active, it is clear that there are a great number of competent and motivated individuals, both professional and support staff, who are committed to doing their best to do this project correctly. That statement applies at each of the offices that we visited, to both staff and operating personnel, and to government employees and contractors alike. There may be relative strengths and weaknesses among the personnel, but there was no evidence of people being satisfied with doing less than a responsible job, whatever their responsibility might have been. They did not always agree with one another, nor I with them, but that does not diminish my respect for their willingness to tackle a very difficult task.

If WIPP is not determined to be a suitable facility as a geologic repository, it does not appear that it will be for the lack of many individuals doing their best to do the job right.

On February 12, 1980, the President of the United States established a comprehensive program for the management of radioactive waste. In a message to Congress on that date, President Carter observed that "[m]any citizens know and all must understand that this problem will be with us for many years. We must proceed steadily and with determination to resolve the remaining technical issues while ensuring full public participation and maintaining the full cooperation of all levels of government. We will act surely and without delay, but we will not compromise our technical or scientific standards out of haste. I look forward to working with the Congress and the states to implement this policy and build public confidence in the ability of the government to do what is required in this area to protect the health and safety of our citizens." A decade has expired since that call to action was made, and its principles remain apt today, as the recently issued DOE Environmental Restoration and Waste Management Five-Year Plan (Ref. 68) demonstrates. We must find the way to address and resolve these issues without delay.

# SUPPLEMENTAL REPORT OF ROBERT W. BISHOP, ESQ.
MEMBER
WASTE ISOLATION PILOT PLANT BLUE RIBBON PANEL

## I. DRAFT FINAL PLAN FOR THE WASTE ISOLATION PILOT PLANT TEST PHASE: PERFORMANCE ASSESSMENT (DECEMBER 1989)

The "Draft Final Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment" (DOE/WIPP 89-011) (December 1989) reflects significant changes that have occurred since issuance of the Draft Plan in April 1989. As stated in my initial report of October 23, 1989, I believe that in situ testing with actual TRU waste is necessary to validate design concepts and models to be used in conducting the Performance Assessment, which will be used to demonstrate compliance with EPA requirements, and to complement past, current and future laboratory testing. It is important to emphasize that the planned experiments, and any additional experiments to be undertaken, are not required to demonstrate regulatory compliance, but rather to reduce uncertainties associated with the waste form and the response of the physical environment at WIPP to the emplacement of those wastes.

With the first emplacement of wastes to begin the experimental program still ostensibly scheduled for July 1, 1990, I remain concerned that a number of significant issues, at least as evidenced by the text of the Draft Final Plan, have yet to be resolved. For example, there is no evidence that a sensitivity analysis has been conducted to ascertain what parameters are of greatest significance to the conduct of the Performance Assessment process to ensure that the Test Phase, and if possible the initial tests, can develop data necessary to narrow the uncertainties by the orders of magnitude required or that the tests are properly focused to address those uncertainties. Another issue that continues to be of concern to me, and to other Panel Members, is the failure to describe (other than in very general terms) how the wastes are to be characterized to determine the type and amount of hazardous constituents (as defined by the Resource Conservation and Recovery Act ("RCRA")) so as to ensure that the experimental data results are correctly interpretable and to enable RCRA compliance to be evaluated. Although the Test Plan may not be the appropriate vehicle to detail DOE's plans to characterize these wastes, accurate waste characterization is critical to the successful conduct of the Test Plan, both as to the configuration of the bins and the selection of drums for the alcove tests.

Attachment I to this report is a letter dated December 21, 1989, from the Chairman of the Advisory Committee on Nuclear Waste of the U. S. Nuclear Regulatory Commission to the Chairman of the U. S. Nuclear Regulatory Commission. That letter clearly describes the Advisory Committee's concerns with the U. S. Environmental Protection Agency's standards and the ability of any facility, including WIPP, to satisfy those standards. As described in my initial report, I share those concerns, and I encourage DOE to work with EPA throughout this process to ensure that DOE's responsibility for the safe, permanent disposal of TRU wastes is reconciled with the EPA requirements contained in 40 C.F.R. Parts 191 and 268. As I stated previously, "[i]t is not in the Nation's best interest for TRU waste, safe though it may be in temporary storage, to remain in that state ad infinitum because of a failure of governmental agencies to work together to develop a facility that can safely, permanently dispose of TRU waste." There is no mention of DOE's regulatory strategy (e.g., how will the decision be made, and to what required confidence level, that Part 191 requirements have been satisfied), which would provide valuable insight regarding whether the Test Phase is properly focused, both now and as the experiments evolve based on the initial data developed.

The test report speaks of the Project's intent to conduct all operational procedures "from waste receipt to retrieval and shipment" with non-radioactive ("cold") non-hazardous materials. If those tests have not already been completed, they should be commenced immediately. For this program, as well as for the Operations Demonstration, criteria should be established for each phase of the waste management system operations whereby it can be concluded, when the criteria are met, that no further demonstration of that phase is necessary. Those criteria should be established in advance, and such shipments or segments of system operations should be conducted so as to ensure the operability of the waste management system. DOE's conclusion to separate the Operations Demonstration from the Test Phase is understandable, but I strongly advocate that planning for the Operations Demonstration should not be given short shrift -- the ability to correctly package and safely transport TRU wastes to WIPP is vitally important, even during the Test Phase.

The commencement and successful conduct of the Test Phase requires that the WIPP Waste Acceptance Criteria (WAC) appropriately integrate all applicable all regulatory and legal requirements. There is no evidence that that critical step has yet been taken. Although developing an appropriately comprehensive WAC has no bearing on the validation of the certification of the Rocky Flats Plant TRU waste, the operational efficiency that would be achieved and the institutional issues that could be resolved force the conclusion that developing a comprehensive WAC should be a priority effort. I, and other Panel Members, have in our reports and in our meetings with DOE identified the need for all requirements to be integrated into a single certification process that meets all applicable criteria. I would direct your attention to pages 19-21 of my report dated October 23, 1989, for a more complete discussion of my concerns and recommendations concerning the need for attention to this issue.

## II. PROGRAM PLAN FOR ENGINEERED ALTERNATIVES (DECEMBER 15, 1989)

I have reviewed the "Program Plan for Engineered Alternatives (December 15, 1989)." I generally concur with the comments made by Panel Members Kubo and Slosky (see letter from Dr. Arthur S. Kubo to Mr. W. John Arthur, III, dated December 29, 1989, and letter from Leonard C. Slosky to Mike McFadden, dated January 16, 1990). In sum, the purpose of the Engineered Alternatives Task Force (EATF), and its authority, is not well-defined and this effort does not appear to be well integrated into the planning for and conduct of the Test Phase, both as to substance and as to schedule. Further, the Program Plan does not suggest that appropriate attention has been given to the hazardous constituents that may be present in the waste and the potential chemical or physical effects those constituents could have on various engineered alternatives under consideration.

Care must be taken to ensure that the EATF focus is not inappropriately weighted towards short-term considerations of achieving facility operation to the potential detriment of those engineered alternatives that might not be cost-effective in the short-term but could significantly change the facility's character over the hundreds and thousands of years that these wastes are to be isolated from the environment.

However, it should be emphasized that the purpose of the EATF (which is not clearly delineated in the Program Plan, although it is described generally in the Draft Final Plan for the Test Phase) is not to choose the "best" waste form but rather to evaluate engineering alternatives that may be required to reduce any major uncertainties or to resolve any facets of unsatisfactory facility performance identified in the Performance Assessment.

## III. WASTE RETRIEVAL PLAN (DOE/WIPP 89-022) (JANUARY 1990 DRAFT)

The development of a viable waste retrieval plan may not be required by law or regulation, but it is required by sound management practice. Such a plan should describe the process that will be utilized, although the specifics will be dependent upon the circumstances that exist at the time the plan is placed into operation. Nonetheless, the plan must be credible and must provide confidence that it is workable and appropriate contingency planning has been incorporated. In a number of respects, it does not appear that the Draft Waste Retrieval Plan satisfies those goals.

The following is a list of examples of areas where further evaluation appears appropriate, or where the text should be modified to more completely describe significant aspects of the waste retrieval process:

(1) It does not appear that appropriate consideration has been given to the restrictions imposed by the U. S. Nuclear Regulatory Commission in the Certificate of Compliance for the TRUPACT-II shipping container (i.e., regulatory approval will be necessary for carrying overpacked containers, and it does not appear that the TRUPACT-II Safety Analysis Report addresses the weight distribution and other factors pertinent to DOE's intended use of these containers, especially with an overpacked Standard Waste Box in a vertical configuration). Further, the current criteria specify the maximum allowable internal container pressure, yet no provisions appear to have been incorporated for ensuring that those requirements are met in an overpacked container.

(2) It is assumed that all retrieved waste containers will be overpacked (see page 3-1), yet surface decontamination may be a far more cost-effective approach for a container whose structural integrity is not in question. In contrast, it is not clear that a standard overpack will accommodate containers (either drums or bins) that no longer have structural integrity, and the Plan is

silent as to what special precautions would be associated in transporting that waste from the underground facility to the overpacking facility, which is to be located on the surface. For that reason, it appears that consideration should be given to establishing at least some overpacking or waste reconfiguration facility underground adjacent to the area from which the wastes are to be retrieved.

(3) Although an argument could be made that the Waste Retrieval Plan should be limited to the physical retrieval of the waste from its emplaced location in the mined rooms or alcoves, it should be anticipated that governmental officials may require that some plan be developed for waste storage or shipment once the waste has been retrieved. The Waste Retrieval Plan is silent as to what would happen to those wastes that are retrieved. If such plans have not been developed, that fact should be acknowledged and an explanation provided of how, and when, that matter is to be addressed.

The suggestion that specific Waste Acceptance Criteria would be established by the designated receiving location suggests a fundamental misunderstanding of the need for compliance with the requirements established by the TRUPACT-II Certificate of Compliance, RCRA, and the agreements with the State of New Mexico.

(4) Although alluded to frequently (e.g., page 2-6), no description is provided of the location or size of the storage available for those containers whose contents may need reworking or, more importantly, for storing contaminated equipment, trash, or mined salt (see page 3-11). Significant details are lacking in the description of the operational constraints imposed by possible radioactive or hazardous material contamination. Phrases such as "acceptable levels" (page 3-1), "prescribed limits" (page 3-3), and "a level acceptable for mined surfaces as defined in applicable procedures" (page 3-11) do not provide confidence that appropriate detailed planning has been conducted.

(5) Although the Waste Retrieval Plan was not developed to provide a definitive description of the WIPP facility, some of the statements contained within the Plan raise significant questions about facility design or the integration of activities upon which Panel Members have previously commented. For example, page 2-16 describes the bins as having a relief capability "to prevent exceeding the design pressure," yet there is no information provided about the likelihood of that event or how the bins will be installed to ensure that any releases resulting from relief valve actuation will be appropriately contained so as to eliminate the radioactive hazard to workers from an uncontrolled release. The process for determining whether free liquids exist (e.g., page 3-4) provides no confidence that this important matter has been properly considered. Perhaps further insight will be provided as the brine stabilization techniques are developed, but a process

must be developed to ensure that any free liquids can be accurately identified or the TRUPACT-II Certification of Compliance modified as appropriate to encompass the worse possible case.

(6) To emphasize the obvious, significant attention must be given to the stabilization of brine or any other free liquids that may be present in the drums or bins. Possible physical or chemical reactions due to the hazardous constituents that may be present in the drums and/or bins must be part of that evaluation.

(7) The facilities at WIPP for drumming and storing waste produced as part of the retrieval process (see page 3-4) have not been identified. If contaminated salt from the underground facility must be removed (see page 3-11), it would seem that a major facility would need to be established that does not now exist.

(8) No assessment has been made of the time that would be required to complete the retrieval process that is consistent with the amount of waste to be emplaced in the currently planned Test Phase (see page 4-2). For planning purposes, it would be appropriate to provide an estimate of the best case scenario, the worse case scenario, and the most likely scenario at various times during the Test Phase (e.g., the time and equipment required to retrieve solely bin wastes; the time and equipment required to retrieve all wastes at the conclusion of the Test Phase).

Attachment I

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. [illegible]

December 21, 1989

The Honorable Kenneth M. Carr
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Carr:

**SUBJECT: COMMENTS ON PROPOSED REVISIONS OF EPA'S HIGH-LEVEL WASTE STANDARDS**

During its 15th meeting on December 20, 1989, the Advisory Committee on Nuclear Waste met with the NRC staff and representatives from the Department of Energy (DOE) and the Environmental Protection Agency (EPA) for additional discussions pertaining to the Standards for a high-level waste (HLW) repository currently being revised by EPA. We previously discussed this matter with a representative from EPA during our 14th meeting on October 11-13, 1989 and the ACNW or its predecessor, the ACRS, have had continuing interactions with the NRC staff on the matter over the past several years. We also had the benefit of the documents referenced.

On the basis of these discussions, we continue to doubt that compliance with the EPA standards can be demonstrated for a specific repository site, even recognizing the caveats included in the standard, such as the "reasonable assurance" phrase that allows for certain flexibilities in the interpretation of probabilistic analyses. If the construction of a Complementary Cumulative Distribution Function clearly demonstrates compliance with the EPA Standards, then the need for interpreting the "reasonable assurance" phrase is removed. If, as is more likely, demonstration of compliance is not clear, it will be necessary to have a definitive understanding of how the NRC staff plans to interpret the wording in the EPA Standards that:

> Proof of the future performance of a disposal system is not to be had in the ordinary sense of the word in situations that deal with much shorter time frames. Instead, what is required is a reasonable expectation, on the basis of the record before the implementing agency, that compliance with 191.13 (a) will be achieved.

The preferred alternative in the plan as outlined in SECY-89-319 for implementation of the EPA Standards calls for the NRC staff to resolve the major problems concerning implementation of Section 191.13 (a) through rulemaking. It is not clear to us, however, how such rulemaking would resolve the uncertainties in applying probabilistic techniques, nor is it clear that this method represents the best approach for coping with problems that are, in the main, a result of what we consider to be an unacceptable set of standards.

We believe that the NRC staff in SECY-89-319 has not provided the Commission an adequate range of alternatives. One such alternative that we recommend would be that the Commission object to the EPA Standards on the basis that:

1. There are no obvious ways for demonstrating compliance of any specific repository site with the Standards. In this sense, the Standards may be unrealistic.
2. The Standards are also overly stringent and inconsistent. There is strong evidence that they will be wasteful of resources with little commensurate benefit.

The EPA Standards are internally inconsistent, in that lower level quantitative limits are more stringent than upper level qualitative goals. Thus far we have been provided no information to convince us that less stringent Standards would not provide adequate protection of the public health and safety. The NRC subsystem performance criteria have the potential for imposing even more stringent requirements on the repository.

While EPA has attempted to justify the added conservatisms as a means for allowing for uncertainties, we fail to understand the logic of this approach. Resolution of the problems of uncertainties would best be pursued through site characterization and performance assessment. The latter process, in particular, can be used to reveal where and to what degree uncertainties exist, and can provide guidance on where additional and better data are needed.

To resolve these issues, we recommend that the NRC staff be more aggressive in dealing with EPA. The task of the NRC staff, as we interpret it, should be to ensure that the EPA Standards are scientifically sound, consistent, and readily subject to interpretation and implementation. With the EPA in the process of revising their Standards, and DOE having announced an overall reassessment of its HLW program, this would appear to be an opportune time for the NRC to undertake these initiatives.

We will be pleased to discuss these matters with you in additional detail, if you desire.

Sincerely,

Dade W. Moeller

Dade W. Moeller,
Chairman

References:

1. SECY-89-319, "Implementation of the U.S. Environmental Protection Agency's High-Level Waste Disposal Standards," dated October 17, 1989
2. EPA Working Draft 1 of 40 CFR Part 191, dated June 2, 1989, "Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"
3. 40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"

December 29, 1989

Mr. Leo P. Duffy
Director
Office of Environmental Restoration
  and Waste Management
Department of Energy
Washington, D.C. 20585

Dear Mr. Duffy:

By letters sent in the latter part of November and early December, the five members of the New Mexico Congressional delegation independently inquired of members of the WIPP Blue Ribbon Panel on their views on questions posed in those letters. Enclosed is a copy of the responses I transmitted today to those inquiries.

Sincerely,

Robert W. Bishop
Member
WIPP Blue Ribbon Panel

RWB:bb
Enclosures

cc: WIPP Blue Ribbon Panel
Dr. Clyde Frank
Ms. Katie Hain

December 29, 1989

The Honorable Pete V. Domenici
United States Senator
United States Senate
Washington, D.C. 20510

Dear Senator Domenici:

As you requested by your letter of November 30, 1989, I am enclosing a copy of the responses I provided to Senator Bingaman and Representative Schiff concerning the Waste Isolation Pilot Plant and my view on that subject as a member of DOE's Waste Isolation Pilot Plant Blue (WIPP) Ribbon Panel. I have also enclosed a copy of my report to the Secretary of Energy that I referenced in those responses.

I would be happy to discuss my views further with you or your staff or to answer any further questions you might have. I would urge your prompt and favorable action on the WIPP land withdrawal legislation so that the experimental program can begin and concomitant data developed to enable a decision to be made regarding whether or not the WIPP facility is appropriate for use for the disposal of the nation's transuranic waste.

Sincerely,

Robert W. Bishop
Member
Waste Isolation Pilot Plant
Blue Ribbon Panel

RWB:bb
Enclosures

December 29, 1989

The Honorable Jeff Bingaman
United States Senate
524 Hart Senate Office Building
Washington, D.C. 20510-3102

Dear Senator Bingaman:

By letter dated November 28, 1989, you asked me, as a member of the DOE's Waste Isolation Pilot Plant Blue Ribbon Panel, to respond to two questions regarding the Waste Isolation Pilot Plant (WIPP) program as part of your deliberations regarding land withdrawal legislation for the WIPP facility. On October 23, 1989, the WIPP Blue Ribbon Panel members presented their individual reports to the Secretary of Energy, and I have enclosed a copy of my report for your information.

With respect to your first question, I would direct your attention to the discussion beginning on Page 8 of my report. Briefly, I believe that in situ testing with actual transuranic wastes is necessary to validate the design concepts and models and the laboratory simulation and small scale tests that have been done to date. As I further explained, although the details of the experimental program continue to evolve, I believe the program itself has been crafted to derive the maximum amount of information from the minimum amount of wastes. As presently configured, the experimental program anticipates the emplacement of up to 0.5 percent of the total WIPP waste volume. That number, and more importantly the reasoning behind the design of the whole experiment program, appear to be sound. I believe the experimental program, including the in situ tests, are necessary to enable a reasoned, technically supportable decision to be made about whether or not the WIPP facility is appropriate for the nation's disposal of TRU waste.

With respect to your second question, I have discussed my opinion concerning the operations demonstration at some length at Pages 10-12 of my report. I believe that discussion is responsive to your question.

I would be happy to discuss my views further with you or your staff or to answer any further questions you might have. I would urge your prompt and favorable action on the WIPP land withdrawal legislation so that the experimental program can begin and concomitant data developed to enable a decision to be made regarding whether or not the WIPP facility is appropriate for use for the disposal of the nation's transuranic waste.

I hope you or your staff will feel free to contact me if you have any further questions.

Sincerely,

Robert W. Bishop
Member
Waste Isolation Pilot Plant
Blue Ribbon Panel

RWB:bb
Enclosure

December 29, 1989

The Honorable Steven Schiff
Congress of the United States
House of Representatives
1520 Longworth Building
Washington, D.C. 20515

Dear Congressman Schiff:

By letter dated December 4, 1989, you asked me, as a member of the DOE's Waste Isolation Pilot Plant Blue Ribbon Panel, to respond to two questions regarding the Waste Isolation Pilot Plant (WIPP) program as part of your deliberations regarding land withdrawal legislation for the WIPP facility. On October 23, 1989, the WIPP Blue Ribbon Panel members presented their individual reports to the Secretary of Energy, and I have enclosed a copy of my report for your information.

With respect to your first question, I would direct your attention to the discussion beginning on Page 8 of my report. Briefly, I believe that in situ testing with actual transuranic wastes is necessary to validate the design concepts and models and the laboratory simulation and small scale tests that have been done to date. As I further explained, although the details of the experimental program continue to evolve, I believe the program itself has been crafted to derive the maximum amount of information from the minimum amount of wastes. As presently configured, the experimental program anticipates the emplacement of up to 0.5 percent of the total WIPP waste volume. That number, and more importantly the reasoning behind the design of the whole experiment program, appear to be sound. I believe the experimental program, including the in situ tests, are necessary to enable a reasoned, technically supportable decision to be made about whether or not the WIPP facility is appropriate for the nation's disposal of transuranic waste.

With respect to your second question, I have discussed my opinion concerning the operations demonstration at some length at Pages 10-12 of my report. I believe that discussion is responsive to your question.

I would be happy to discuss my views further with you or your staff or to answer any further questions you might have. I would urge your prompt and favorable action on the WIPP land withdrawal legislation so that the experimental program can begin and concomitant data developed to enable a decision to be made regarding whether or not the WIPP facility is appropriate for use for the disposal of the nation's transuranic waste.

I hope you or your staff will feel free to contact me if you have any further questions.

Sincerely,

Robert W. Bishop
Member
Waste Isolation Pilot Plant
Blue Ribbon Panel

RWB:bb
Enclosure

December 29, 1989

The Honorable Joe Skeen
Congress of the United States
House of Representatives
1007 Longworth House Office Building
Washington, D.C. 20515

Dear Congressman Skeen:

By letter dated November 29, 1989, you asked me, as a member of the DOE's Waste Isolation Pilot Plant Blue Ribbon Panel to respond to questions regarding the Waste Isolation Pilot Plant (WIPP) program as part of your deliberations regarding land withdrawal legislation for the WIPP facility. On October 23, 1989, the WIPP Blue Ribbon Panel members presented their individual reports to the Secretary of Energy, and I have enclosed a copy of my report for your information.

The following are my responses to the questions contained in your letter of November 29, 1989:

(1) My analysis of the proposed in situ tests is provided on Pages 8 through 10 of my report. My conclusion is that in situ testing with actual transuranic waste is necessary to validate the laboratory and small-scale tests and the computer simulations that have been and will be conducted under the on-going experimental program. No matter how well designed the laboratory and other small-scale tests, there is no way to replicate actual waste characteristics and physical interactions than to use actual wastes under "real" conditions. The experimental program is designed to provide data to enable a technically justifiable decision to be made of whether or not the WIPP facility is appropriate for use in disposing of the nation's transuranic wastes.

(2) My recommendations concerning the operations demonstration are provided on Pages 10 through 12 of my report. In brief, a well thought-out functional demonstration of the entire waste management system should be conducted on a schedule consistent with planned facility operations and designed such that the handling and transportation subsystems do not become the critical path for facility operation. Criteria for acceptance of each segment of the waste management system should be developed in advance of waste movement and an appropriate schedule for conducting those operations

established so that assurance can be provided that these systems can support facility operations.

(3) By agreement with the State of New Mexico, DOE has committed to satisfy the requirements of 40 C.F.R. Subpart A prior to the emplacement of the first transuranic wastes in the WIPP facility. DOE's test plan envisions that the experimental program and operations demonstration, and the data collection and analysis necessary to support the performance assessment required under 40 C.F.R. Part 191 Subpart B, will be completed in approximately five years. Under current law, the WIPP facility cannot operate until the requirements of 40 C.F.R. Part 191 Subpart B are satisfied.

(4) Under DOE's current planning, the Final Safety Analysis Report will be completed on or about the end of January, 1990.

(5) The Supplemental Environmental Impact Statement is currently scheduled by DOE to be issued in early January, 1990, and the Secretary's Record of Decision issued in early February.

(6) As I described in Pages 16-18 of my report, I believe that significant additional cooperative efforts need to be undertaken by DOE and EPA to resolve their respective responsibilities for implementing national policy regarding the safe disposal of transuranic wastes. Although the application of Resource Conservation and Recovery Act (RCRA) requirements to the WIPP facility has not been investigated in any depth by the WIPP Blue Ribbon Panel, I believe that the unique nature of the wastes to be disposed of at WIPP and the fundamental design and purpose of WIPP clearly demonstrate that WIPP is not the type of facility that was envisioned to be regulated under RCRA. As I recommended in my report, DOE and EPA should work closely to address the RCRA requirements and ensure that the application of those requirements to WIPP is justifiable, rather than require blind adherence to regulations designed for a far different purpose.

(7) The Environmental Evaluation Group, the Waste Isolation Pilot Plant Panel of the National Academy of Science's Board on Radioactive Waste Management, and the Secretary's WIPP Blue Ribbon Panel itself, have raised a number of issues that DOE should address. As I observed on Page 15 of my report, I believe that DOE should establish a mechanism to evaluate and consider the observations and recommendations of those groups and others who have commented on this program, including any comments that might be received from the New Mexico Congressional delegation. I believe there is value that can be realized from independent insight, but I also believe that adoption of any group's or individual's comments should be done on their merits, lest questions be raised about who is responsible for the project -- there can and should be no doubt that

> DOE is responsible for ensuring that the nation's interests are protected, and that responsibility cannot be shirked by attempting to placate critics where, in DOE's technical, engineering and operating judgment, those comments should be rejected rather than accepted. That goes for any comments provided to DOE, including those of the Blue Ribbon Panel.

I would encourage you to have your staff read my report and those of the other Blue Ribbon Panel members. I think you might be surprised by the number of areas in which the Panel members' conclusions were very similar, notwithstanding the diversity of our experience and perspective.

I would be happy to discuss my views further with you or your staff or to answer any further questions you might have. I would urge your prompt and favorable action on the WIPP land withdrawal legislation so that the experimental program can begin and concomitant data developed to enable a decision to be made regarding whether or not the WIPP facility is appropriate for use for the disposal of the nation's transuranic waste.

I hope you or your staff will feel free to contact me if you have any further questions.

Sincerely,

Robert W. Bishop
Member, Waste Isolation Pilot Plant
Blue Ribbon Panel

RWB:bb
Enclosure

December 29, 1989

The Honorable Bill Richardson
Congress of the United States
House of Representatives
332 Canon House Office Building
Washington, D.C. 20515

Dear Congressman Richardson:

By letter dated November 29, 1989, you asked me, as a member of the DOE's Waste Isolation Pilot Plant Blue Ribbon Panel to respond to two questions regarding the Waste Isolation Pilot Plant (WIPP) program as part of your deliberations regarding land withdrawal legislation for the WIPP facility. On October 23, 1989, the WIPP Blue Ribbon Panel members presented their individual reports to the Secretary of Energy, and I have enclosed a copy of my report for your information.

Pages 8 through 10 of my report describe my analysis of the need for _in situ_ testing with actual transuranic wastes emplaced at the WIPP facility. The present experimental test program envisions emplacing up to 0.5 percent of the volume of the WIPP facility to provide data to support the completion of the performance assessment such that a determination can be made about whether or not the WIPP facility is an appropriate repository for the nation's transuranic wastes. It may be of interest that the U. S. Environmental Protection Agency, in comments to DOE dated October 19, 1989, has suggested that DOE evaluate the feasibility of augmenting its test plan by adding two instrumented full-scale rooms to the experimental program (which would amount to approximately 1.6 percent of the total waste storage volume) to provide full-scale, long time duration (30-50 years) data on transuranic waste gas generation and other physical phenomena and the overall performance of the WIPP facility.

My recommendation concerning the operations demonstration is contained in Pages 10 through 12 of my report. Briefly, I believe the operations demonstration really begins with the emplacement of waste to support the _in situ_ experiments and should continue until such time as a determination can be made of the operating viability of the waste handling and transportation systems, including both the generating sites and the WIPP facility itself. I believe that system criteria for operability of the waste management system should be determined in advance and operations planned to provide confidence that the system can operate properly. Those tests should be scheduled, and rescheduled as may be appropriate, to fit into the overall facility operations schedule, with the goal being to enable the waste management system to be evaluated and modified as necessary to assure it can support system operations without becoming the critical path to facility startup.

I would be happy to discuss my views further with you or your staff or to answer any further questions you might have. I would urge your prompt and favorable action on the WIPP land withdrawal legislation so that the experimental program can begin and concomitant data developed to enable a decision to be made regarding whether or not the WIPP facility is appropriate for use for the disposal of the nation's transuranic waste.

I hope you or your staff will feel free to contact me if you have any further questions.

Sincerely,

Robert W. Bishop
Member, Waste Isolation Pilot Plant
Blue Ribbon Panel

RWB:bb
Enclosure

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October 31, 1989

The Honorable Kenneth M. Carr
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Chairman:

I commend to your attention the enclosed draft report on low-level radioactive wastes prepared by the Office of Technology Assessment.

I am troubled by the report's findings on mixed waste. As I understand the matter, mixed waste can no longer be disposed of legally because the three existing low-level waste facilities are not licensed by the Environmental Protection Agency to accept it. The new low-level waste facilities being developed under the Low-Level Radioactive Waste Policy Act may someday provide disposal capacity for mixed waste, but the new facilities are still years off and the special problems presented by mixed waste may delay their completion even further.

Moreover, OTA found that mixed waste generators cannot meet the EPA's requirements for treating this waste because no off-site treatment facilities are available. OTA also found that mixed waste generators cannot store their waste until disposal sites become available because EPA permits storage only for purposes of accumulating sufficient quantities to facilitate proper recovery, treatment, or disposal. Since no disposal or off-site treatment facilities exist, this condition plainly cannot be met.

Accordingly, OTA concluded that mixed waste generators are left with only three options for dealing with mixed waste: disposing of it illegally, storing it illegally, or eliminating the use of the hazardous constituent responsible for generating the waste, which often means going out of business. Clearly, this is an unacceptable state of affairs.

The report offers two thoughtful recommendations to address the problem. First, OTA suggests that EPA permit generators to

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store mixed waste for which no disposal or treatment capacity currently exist so long as a good faith effort is being made to develop disposal or treatment facilities. Second, OTA recommends that the Commission, EPA, and the Department of Energy devote more of their research funds to developing treatment technologies for mixed waste.

I would appreciate your views on these proposals. Can generators safely store mixed wastes on-site until disposal or treatment facilities become available? Can EPA permit such storage under existing legislative authority? What is the Commission now doing to facilitate development of disposal and treatment alternatives? Can the Commission increase its commitment to these efforts within existing appropriations? What progress has the Department of Energy made in developing treatment technologies for defense mixed waste that may be applied to civilian mixed waste? How long will it take the NRC and EPA to resolve the remaining regulatory conflicts and inconsistencies that may hamper development of mixed waste disposal facilities?

The OTA report suggests that an EPA-NRC task force be formed to resolve problems resulting from your agencies' dual regulation of mixed waste and to coordinate an effective research and development effort. While an interagency staff task force might be necessary, I urge you and Mr. Reilly to take charge of the effort personally to see that a safe and workable mixed waste management program is put in place without further delay.

I appreciate your attention to this issue.

Sincerely,

Mo Udall

Morris K. Udall
Chairman

ONE HUNDRED FIRST CONGRESS

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October 31, 1989

The Honorable William K. Reilly
Administrator
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Reilly:

I commend to your attention the enclosed draft report on low-level radioactive wastes prepared by the Office of Technology Assessment.

I am troubled by the report's findings on mixed waste. As I understand the matter, mixed waste can no longer be disposed of legally because the three existing low-level waste facilities are not licensed by the Environmental Protection Agency to accept it. The new low-level waste facilities being developed under the Low-Level Radioactive Waste Policy Act may someday provide disposal capacity for mixed waste, but the new facilities are still years off and the special problems presented by mixed waste may delay their completion even further.

Moreover, OTA found that mixed waste generators cannot meet the EPA's requirements for treating this waste because no off-site treatment facilities are available. OTA also found that mixed waste generators cannot store their waste until disposal sites become available because EPA permits storage only for purposes of accumulating sufficient quantities to facilitate proper recovery, treatment, or disposal. Since no disposal or off-site treatment facilities exist, this condition plainly cannot be met.

Accordingly, OTA concluded that mixed waste generators are left with only three options for dealing with mixed waste: disposing of it illegally, storing it illegally, or eliminating the use of the hazardous constituent responsible for generating the waste, which often means going out of business. Clearly, this is an unacceptable state of affairs.

The report offers two thoughtful recommendations to address the problem. First, OTA suggests that EPA permit generators to store mixed waste for which no disposal or treatment capacity currently exist so long as a good faith effort is being made to develop disposal or treatment facilities. Second, OTA recommends that EPA, the Nuclear Regulatory Commission, and the Department of Energy devote more of their research funds to developing treatment technologies for mixed waste.

I would appreciate your views on these proposals. Can generators safely store mixed wastes on-site until disposal or treatment facilities become available? Can EPA permit such storage under existing legislative authority? What is EPA now doing to facilitate development of disposal and treatment alternatives? Can EPA increase its commitment to these efforts within existing appropriations? What progress has the Department of Energy made in developing treatment technologies for defense mixed waste that may be applied to civilian mixed waste? How long will it take the NRC and EPA to resolve the remaining regulatory conflicts and inconsistencies that may hamper development of mixed waste disposal facilities?

The OTA report suggests that an EPA-NRC task force be formed to resolve problems resulting from your agencies' dual regulation of mixed waste and to coordinate an effective research and development effort. While an interagency staff task force might be necessary, I urge you and Chairman Carr to take charge of the effort personally to see that a safe and workable mixed waste management program is put in place without further delay.

I appreciate your attention to this issue.

Sincerely,

Mo Udall

Morris K. Udall
Chairman

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

CHAIRMAN

January 19, 1990

The Honorable Morris K. Udall, Chairman
Committee on Interior and Insular Affairs
United States House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

I am responding to your letter dated October 31, 1989, in which you discuss several issues related to the treatment and disposal of mixed wastes. Specific responses to your questions on this matter are provided in Enclosure 1.

The mixed waste issue is one of many interface issues between the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA). The Commission has initiated discussions with EPA at the highest levels in an attempt to resolve these issues, especially those associated with dual regulation of NRC-licensed activities. In general, the Commission considers dual regulation to be unnecessarily burdensome and wasteful. At present, a prudent course of action would be for both NRC and EPA to continue to work together to eliminate dual regulation where the Commission's current regulatory framework already ensures adequate protection of public health and safety and the environment.

Your letter commended to our attention the Office of Technology Assessment's (OTA's) report on low-level radioactive waste, including OTA's recommendation on the establishment of an EPA-NRC task force to address the problems associated with mixed waste. Given the complexities associated with dual jurisdiction, the Commission believes that some measure of progress has been achieved to date on the mixed waste issue. We nevertheless endorse the OTA-recommended high-level EPA-NRC task force as the most effective means to focus regulatory attention not only on mixed waste, but on all such issues for which our agencies have dual or overlapping regulatory authority. I had previously discussed with Administrator Reilly the establishment of such a joint EPA-NRC task force, and we are presently evaluating the merits of such an approach.

Originated by: RBoyle, NMSS

In the interim, the NRC staff is continuing to work with the EPA staff in an effort to resolve issues in specific program areas. With regard to mixed waste, NRC and EPA staffs have been working closely for the past several years, resulting in the publication of several joint guidance documents (enclosed). Several other documents, on which EPA and NRC staffs are now working, should clarify the regulatory framework for mixed waste on remaining issues, thus aiding the development of suitable treatment and disposal technologies. I understand that EPA plans to issue a document shortly that should provide information relevant to many of your concerns. This document is intended to give mixed waste handlers a basic understanding of the Resource Conservation and Recovery Act (RCRA) requirements and Land Disposal Restrictions (LDRs) and to describe how the LDRs may affect storage and disposal of mixed wastes. In addition, EPA, with NRC assistance, is conducting a series of national workshops for State, NRC, and EPA inspectors. The workshops are intended to familiarize these persons with mixed waste issues and to improve the regulation of mixed wastes.

There is one issue in particular -- whether there are inconsistencies in the specific requirements of RCRA and the Atomic Energy Act (AEA) for mixed waste facilities -- that OTA has raised in its report and that we think deserves special mention here. As we indicate in the attached answers to your specific questions, our staff has not yet identified any literal conflicts in the requirements of RCRA and the AEA that would frustrate compliance with the joint approach established by EPA and NRC. However, the Commission would note that section 1006 of RCRA does give us the authority to waive the application of specific requirements of RCRA upon a finding by the Commission that such requirements are inconsistent with the requirements established by the Commission under the AEA. Should such a situation arise, this provision appears to provide the Commission sufficient authority to resolve that situation.

It is our hope that the joint approach to the mixed waste issue that we and EPA have established will lead to the successful development and operation of mixed waste disposal facilities as the States move forward to carry out their responsibilities under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA). We are committed to making this approach work. If the joint approach proves to be unsuccessful, however, it may well be that further legislative consideration of this matter will be necessary to achieve the objectives of the LLRWPAA.

The Commission would also emphasize that if the joint approach is to succeed, it is important at this critical juncture in the site development process that the regulatory framework established by the Federal Government remains stable so that the States and compacts can move forward with their site development efforts. Any significant shift at this stage in the regulatory or legislative framework that has been established pursuant to the AEA or RCRA will almost certainly disrupt progress of the States and compacts in the development of new low-level waste disposal sites and thereby jeopardize their ability to meet the 1993 milestone for having new sites in operation. Accordingly, the Commission would urge the Congress, particularly as it embarks upon reauthorization of RCRA, to be sensitive to the special needs in this area.

We appreciate your interest in these issues, which the NRC has been attempting to resolve through administrative actions during the last five years. The current focus of both agencies on the complexities and burdens of dual regulation promises to accelerate this process. Our objective throughout this process has been and will continue to be pursuing protection of human health and the environment at a minimum cost to society. We share your concern about the present mixed waste dilemma and are doing all we can within NRC's authority to resolve it expeditiously.

Sincerely,

Kenneth M. Carr

Kenneth M. Carr

Enclosures:
1. Questions/Responses
2. Guidance on the Definition of Identification of LLMW
3. NRC-EPA Siting Guidelines for Disposal of LLMW
4. Joint NRC-EPA Guidance on a Conceptual Design

cc: The Honorable Don Young
The Honorable William K. Reilly, EPA

## ENCLOSURE 1

## QUESTIONS/RESPONSES

**Question:** Can generators safely store mixed wastes on site until disposal treatment facilities become available?

**Response:** Yes. Storage of mixed wastes on site for a reasonable period until treatment or disposal facilities become available should not be a radiological safety problem. NRC licensees must meet all appropriate NRC regulatory requirements for storage of such wastes. These requirements are adequate to protect public health and safety. Under these requirements, a licensee may safely store low-level wastes for up to five years absent an amendment to the appropriate license. This 5-year limit reflects a long-standing NRC position that encourages timely disposal of waste rather than extended storage to avoid excessive accumulation of waste and potential degradation of storage containers prior to treatment or disposal.

**Question:** What is the Commission now doing to facilitate development of disposal and treatment alternatives?

**Response:** Although primary responsibility for the development of treatment and disposal technologies rests with the nuclear industry and the Department of Energy (DOE), NRC is currently conducting several activities that should facilitate development by clarifying the regulatory framework for mixed waste management. NRC and EPA are jointly developing guidance documents on waste characterization, inspection, and storage of mixed waste. The waste characterization guidance will address occupational exposures during testing. The inspection guidance will provide NRC Regional, Agreement State, EPA Regional, and Authorized State inspectors with background information on mixed waste licensing and permitting, inspection planning and coordination, cross-training, and conduct of mixed waste inspections. The storage guidance will combine the NRC radioactive waste storage recommendations with EPA storage requirements. In addition, NRC is providing assistance to EPA in the permit writers' workshop on mixed waste regulation.

**Question:** Can the Commission increase its commitment to these efforts within existing appropriations?

**Response:** No. However, the Commission considers NRC's current effort to be adequate and appropriate.

Question: What progress has the DOE made in developing treatment technologies for defense mixed waste that may be applied to civilian mixed waste?

Response: NRC's knowledge of DOE progress in developing treatment technology for defense mixed wastes is limited. However, the NRC is aware of the developmental work being conducted at Los Alamos National Laboratory on a controlled-air incinerator. DOE believes that incineration of radioactively contaminated wastes can significantly reduce the volume of the waste and estimates volume reduction from this method to be in excess of 100 to 1.

At the Hanford site, DOE is constructing grouted waste disposal vaults for the low-level radioactive wastes contained in the double-shelled tanks. DOE claims that these vaults will comply with RCRA requirements for a mixed waste disposal unit.

The technologies applied in both of these DOE defense activities potentially could be applied to civilian mixed waste.

Question: How long will it take the NRC and EPA to resolve the remaining regulatory conflicts and inconsistencies that may hamper development of mixed waste disposal facilities?

Response: We do not know. The amount of time necessary for both agencies to resolve regulatory issues that hamper development of new facilities is uncertain. We have not identified any literal conflicts or inconsistencies between NRC's and EPA's regulations for mixed waste. However, the differences between the regulations, the perception that they may be inconsistent, and the associated economic and political uncertainties have thwarted progress in developing new disposal and treatment facilities for such waste. The volume of mixed waste that will be generated in most States or Compacts is relatively small, and industry is reluctant to invest in treatment and disposal facility development with high economic risk and a burdensome dual regulatory scheme. The same political pressures that make States and Compacts unwilling to accept low-level waste from outside sources also make these parties unwilling to accept other States' mixed wastes, further complicating the development of mixed waste treatment and disposal facilities. Therefore, we expect that management of mixed wastes will continue to be a troublesome and time-consuming problem for waste generators, site developers, and regulatory agencies.

JAN 31 1990

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 25 1990

THE ADMINISTRATOR

Honorable Morris K. Udall
Chairman, Committee on Interior
and Insular Affairs
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

I am pleased to respond to your letter of October 31, 1989, in which you commended to my attention the Office of Technology Assessment's (OTA's) recent draft report on low-level radioactive wastes. I believe it is a valuable report that identifies many of the key issues the nation faces in mixed waste management.

In your letter you express concern about the report's findings on mixed waste. For example, you note the current absence of permitted disposal facilities for low-level wastes. We agree with you on the importance of this issue and the need to develop new disposal capacity rapidly, in accordance with the Low-Level Radioactive Waste Policy Act. We have been working with the States through the Low-Level Radioactive Waste Forum to inform them of mixed waste requirements under the Resource Conservation and Recovery Act (RCRA), and we will place a high priority on permitting disposal facilities as they are sited. (Of course, where a facility is in a RCRA-authorized State, the State has primary responsibility for permitting it.)

I should clarify one point in your letter, however. You state that mixed waste can no longer be disposed of legally because the three existing low-level waste facilities are not licensed by EPA to receive mixed waste. In fact, two of these facilities were not permitted for mixed waste disposal because they chose not to seek RCRA permits. The third facility is located in a State where mixed wastes are not yet subject to RCRA hazardous waste regulations. Because of this, it is not prohibited under RCRA from receiving or disposing of mixed waste, although, as a practical matter, once the State is authorized to regulate mixed waste, this facility would need to qualify for interim status or obtain a RCRA permit. The decision by the facility owner or operator not to accept mixed waste during the hiatus may be the most appropriate approach, since it is unlikely a RCRA permit will be sought once the State has the authority to regulate mixed wastes.

Your letter also expresses concern about the difficulties mixed waste generators are now facing in meeting EPA's hazardous waste treatment standards, which currently apply to a significant portion of mixed wastes. As the OTA report pointed out, permitted treatment capacity is virtually non-existent for mixed wastes. At the same time, the statute prohibits the storage of wastes subject to treatment standards, except in limited circumstances. As you indicate, this places mixed waste generators in a difficult situation.

To address this situation, the OTA report suggests that EPA allow generators to store mixed waste for which no disposal or treatment capacity exists, as long as they have made a good-faith effort to develop treatment or disposal capacity. You should recognize that the storage prohibition discussed above is an explicit RCRA statutory requirement, rather that an EPA regulatory construct. Therefore, our flexibility in this area is somewhat limited.

Your letter also poses several specific questions which I have answered below.

First, can generators safely store mixed wastes on site until disposal or treatment facilities become available? EPA believes that hazardous wastes (including mixed wastes) can be safely stored in RCRA-regulated facilities. However, we believe that long-term storage should not be used to circumvent treatment standards, and that any storage should be allowed only pending the development of adequate treatment and storage capacity.

Second, can EPA permit such storage under existing legislative authority? We currently believe that section 3004(j) of the statute prohibits such storage, even if a generator can argue that no treatment or disposal capacity exists.

Third, what is EPA now doing to facilitate development of disposal and treatment alternatives? EPA has developed joint guidance with the Nuclear Regulation Commission (NRC) on disposal facility design, and we are consulting with the Department of Energy (DOE) on the development of treatment standards for mixed wastes. We also will give a high priority to permitting new mixed waste treatment and disposal facilities, as applications are submitted. However, we believe that the main responsibility for developing disposal and treatment alternatives lies with the regulated industry and DOE.

Fourth, can EPA increase its commitment to these efforts within existing appropriations? EPA must divide its resources among a large number of competing priorities. Therefore, it is difficult at this point to make a significantly greater commitment to mixed waste issues. We have set priorities within this area, and have committed significant resources to specific concerns, such as review of DOE's no-migration petition for the Waste Isolation Pilot Plant and enforcement activities at the Rocky Flats Plant. We have also placed a high priority on coordination with NRC and development of several guidance documents on specific mixed waste issues.

Fifth, what progress has DOE made in developing treatment technologies for defense mixed waste that may be applied to civilian mixed waste? We are working now with DOE to develop treatment standards for certain categories of mixed wastes; these standards will generally be applicable to commercial mixed wastes as well. For the most part, however, DOE's work is still at the design phase. We strongly support the coordination of this effort with efforts by the regulated industry or NRC in the same area, and will do what we can to facilitate it.

Sixth, how long will it take NRC and EPA to resolve the remaining regulatory conflicts and inconsistencies that may hamper development of mixed waste disposal facilities? EPA generally believes that the perception of regulatory inconsistencies is far greater than the reality. At the same time, however, we are working with NRC, DOE, and others on a series of specific questions, such as the development of chemical analysis protocols specific to mixed wastes and guidance on identifying and resolving regulatory inconsistencies. It is my hope that concerns over these and other issues will abate during the next year, as the States move forward under the Low-Level Radioactive Waste Policy Act to provide mixed waste disposal capacity.

Finally, I would like to comment on OTA's suggestion that an NRC-EPA task force be formed to resolve problems resulting from the two agencies' dual regulation of mixed waste. I have previously discussed this with Chairman Carr, as well as with his predecessor. You should be aware, however, that EPA and NRC established the Interface Council to ensure consultation and coordination between the two agencies, and that our respective staffs routinely meet to address mixed waste issues. I will, however, explore the need for increased oversight by my office, as well as the need for a special task force.

In summary, I share your concern that mixed waste issues be promptly addressed and that adequate treatment and disposal capacity be provided for the nation's mixed waste. Please let me know if my staff or I can provide you further assistance, or if you wish to discuss these issues in more detail.

Sincerely yours,

William K. Reilly

William K. Reilly

# WASTE ISOLATION PILOT PLANT

# BLUE RIBBON PANEL

# MEMBER REPORT

Dr. Arthur S. Kubo
October 23, 1989

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# WASTE ISOLATION PILOT PLANT
# BLUE RIBBON PANEL
# MEMBER REPORT

**Dr. Arthur S. Kubo**
**October 23, 1989**

## I. INTRODUCTION

The Waste Isolation (WIPP) Blue Ribbon Panel (BRP) was established by the Secretary of Energy on August 31, 1989. Each panel member is individually chartered to review, assess, and report on the following WIPP issues (Statement of Work):

> Independent validation of the certification of Rocky Flats Plant (RFP) waste at both Rocky Flats and at Idaho National Engineering Laboratory (INEL) for shipment to WIPP.
>
> Concept and timing for the WIPP Operations Demonstration Test Plan.
>
> Whether the WIPP Program can perform an operations demonstration in parallel with the conduct of performance assessment experiments.

## II. ASSESSMENT METHODOLOGY

This assessment of WIPP issues is based on two WIPP BRP briefing sessions/meetings augmented by individual review of data and follow-up of specific questions. Various members attended separate briefings and meetings and made reports as appropriate to the panel.

On September 11 through 14, 1989, the BRP toured and attended briefings (Reference 80, Appendix A) at DOE's Albuquerque Operations Office, the WIPP Facility (Carlsbad, NM), the SWEPP and the TRU Waste Temporary Storage Facility (INEL, ID), and the Rocky Flats Plant (RFP, CO). The principal WIPP technical, management, and program personnel were introduced. EEG and NAS representatives made presentations in Albuquerque. The introductory tour was well organized, informative, and candid.

On September 25 and 26, 1989, a BRP-requested follow-up meeting in Denver occurred. Selected personnel from WIPP/INEL/RFP and supporting contractors (Westinghouse, Sandia, and IT) attended the meeting. The BRP requested answers to a list of questions (Appendix B) organized in nine subject areas: Organizational Relationships; The Legal Basis and Requirements for WIPP; The Methodology to Reduce Technical Uncertainty; The Interrelationships Between the Waste Acceptance Criteria (WAC), Performance Assessment (PA), and No Migration Petition (NMP); The WAC Certification (WACC), Quality Assurance/Quality Control (QA/QC), and Security; The RFP Waste Certification Validation Program; PA and Operations Demonstration (OD); Transportation; and Miscellaneous.

The BRP was provided with a substantial library of documents and, in turn, requested numerous other references. In addition to the documents, verbal information obtained outside of the formally-convened BRP meetings is referenced in Appendix A. This panel member's report is based on the review of information provided in Appendix A.

## III. EXECUTIVE SUMMARY

The Executive Summary is presented in viewgraph format in Figures 1 through 3.

## IV. ASSESSMENT

The major findings can be summarized into four statements:

(1) The various technical, plant, and operational groups supporting the WIPP Program demonstrate technical competence and excellent motivation;

(2) The WIPP Program embraces three important and entwined national issues -- development of a geologic disposal facility for nuclear wastes, implementation and rationalization of current conflicting mixed waste regulations, and management of TRU wastes as part of the production of defense nuclear materials;

(3) The TRU/Mixed TRU Waste and WIPP Program requirements have developed based on dynamic national defense, technical, public, and regulatory needs. The current unfocused program strategy and execution reflect this erratic process; and

(4) The TRU/Mixed TRU Waste and WIPP Program effectiveness, organizational charters, programmatic and technical integration, and conflict resolution lag behind the unfolding requirements.

These findings contribute greatly to the current WIPP dilemma and, in a significant way, have led to the specific BRP assessment issues. In addition to the responses to the specific questions posted to the panel, these findings lead to the following major recommendations:

(1) DOE should develop a proactive DOE-wide Mixed Waste Management strategy; establish a program management structure aligned with the strategy; assign a full-time HQ-field program management organization and staff to execute the strategy in an integrated, coherent manner; and centralize authority at the HQ level; and

(2) DOE should adopt a formal systems engineering approach to the design, testing, and operation of the WIPP. This process should begin with the systematic identification of all requirements that must be meet to establish an operational WIPP facility and a Management Plan to achieve the desired program goals.

The remainder of this report provides the rational for the recommendations outlined in the Executive Summary.

## V. OBSERVATIONS, RECOMMENDATIONS AND DISCUSSION:

### A. Validation of RFP Waste Certifications

The circulated RFP Certified Waste Verification Program Plan, September 13, 1989, Reference 60, was withdrawn for further DOE staff coordination. The review of the WIPP WAC and the RFP WAC Certification Process suggests five issues that underlie the certification process.

1. **Is the management of the WAC standard appropriate to the WIPP and TRU/Mixed TRU Waste Program?**

**OBSERVATION A.1:**

The WIPP WAC is the integrating configuration control document for DOE's TRU Waste Management Program, but it does not fully integrate the TRUPACT II, Performance Assessment, Consultation and Cooperation (C&C) Agreement, Stipulated Agreement, and RCRA requirements to establish a single standard for TRU/Mixed TRU waste acceptable for disposal at WIPP.

## FIGURE 1: VALIDATION OF RFP WASTE CERTIFICATIONS

**WIPP BLUE RIBBON PANEL CHARTER**

INDEPENDENT VALIDATION OF THE CERTIFICATION OF ROCKY FLATS PLANT (RFP) WASTE AT BOTH ROCKY FLATS AND AT IDAHO NATIONAL ENGINEERING LABORATORY (INEL) FOR SHIPMENT TO WIPP

**KEY QUESTIONS:**

- *IS THE MANAGEMENT OF THE WAC STANDARD APPROPRIATE?*
- *IS THE WAC WASTE PACKAGE CERTIFICATION PROCESS ADEQUATE?*
- *IS THE WIPP WASTE INFORMATION SYSTEM DATA BASE ACCURATE?*
- *IS THE WIPP WAC QA PROGRAM EFFECTIVE?*
- *WHAT SHOULD THE RFP RECERTIFICATION PLAN BE BASED ON?*

*IS THE MANAGEMENT OF THE WAC STANDARD APPROPRIATE?*

**RECOMMENDATION A.1:**

- SEPARATE THE WAC APPROVAL AUTHORITY FROM THE CERTIFICATION AND AUDIT FUNCTIONS
- CHARTER A TRU/MIXED TRU WASTE ACCEPTANCE CRITERIA CONFIGURATION MANAGEMENT BOARD TO INTEGRATE, COORDINATE, AND APPROVE THE WIPP WAC
- RECHARTER THE WIPP WAC CERTIFICATION COMMITTEE TO CERTIFY AND AUDIT THE WAC CERTIFICATION PROCESS AT THE OPERATING SITES

*IS THE TRU/MIXED TRU WASTE CERTIFICATION PROCESS ADEQUATE?*

**RECOMMENDATION A.2:**

- SAMPLE WASTE PACKAGES AT RFP ROUTINELY
- DEVELOP AND USE HAZARDOUS WASTE ASSAY INSTRUMENTATION
- CROSS-CALIBRATE ASSAY INSTRUMENTATION AMONG OPERATING SITES
- OBTAIN RCRA HAZARDOUS MATERIALS DATA DURING ROUTINE PACKAGE SAMPLING
- ASSESS RTR TECHNICIAN PERFORMANCE ON A ROUTINE BASIS
- DOCUMENT RTR TECHNICIAN PREREQUISITE SKILLS AND WORK FUNCTIONS.

*IS THE WIPP WASTE INFORMATION SYSTEM (WWIS) DATA BASE ACCURATE?*

**RECOMMENDATION A.3:**

- ESTABLISH GLOBAL WWIS SECURITY AND QA STANDARDS
- AUTOMATE DATA TRANSFER AS MUCH AS POSSIBLE TO REDUCE HUMAN ERROR
- VERIFY ON ARRIVAL AT WIPP EACH PACKAGE DATA DESCRIPTION USING AN EASILY MEASURED PARAMETER (SUCH AS WEIGHT)

## FIGURE 1: VALIDATION OF RFP WASTE CERTIFICATIONS (CONT)

*IS THE WIPP WAC QA PROGRAM MANAGED AND EXECUTED EFFECTIVELY?*

RECOMMENDATION A.4:

- CONDUCT AN INDEPENDENT REVIEW OF THE WIPP WAC QA PROGRAM

*WHAT SHOULD THE RFP RECERTIFICATION PLAN BE BASED ON?*

RECOMMENDATION A.5:

- INCORPORATE IN THE RECERTIFICATION PROCESS:
  - CERTIFIED AND PROPER TECHNICAL PROCEDURES WITH RANDOM PHYSICAL PACKAGE INSPECTION
  - RFP ON-SITE WASTE RECERTIFICATION BY OTHER THAN RFP EMPLOYEES
  - FULL-TIME WACCC AUDIT TEAM PRESENCE DURING CERTIFICATION PROCESS
  - 100 PERCENT COMPARISON OF ORIGINAL VS NEW RTR TAPES OF EACH ON-SITE RFP TRU WASTE PACKAGE AT SWEPP

*INTENTIONALLY LEFT BLANK*

RECOMMENDATION A.5 (CONT):

- CONDUCT AN UNANNOUNCED AUDIT OF RFP RECORDS BASED ON A CONTROLLED AUDIT PLAN
- PREBRIEF RECERTIFICATION GOALS AND PROCEDURES TO ALL AFFECTED STATE GOVERNMENTS
- POST BRIEF ALL AFFECTED STATE GOVERNMENTS ON THE RESULTS OF THE AUDIT
- ANNOUNCE PROGRAM RESULTS PUBLICLY

FIGURE 2: THE RELATIONSHIP BETWEEN THE PERFORMANCE ASSESSMENT AND OPERATIONS DEMONSTRATION

**WIPP BLUE RIBBON PANEL CHARTER**

CONCEPT AND TIMING FOR THE WIPP OPERATIONS DEMONSTRATION TEST PLAN

WHETHER THE WIPP PROGRAM CAN PERFORM AN OPERATIONS DEMONSTRATION IN PARALLEL WITH THE CONDUCT OF PERFORMANCE ASSESSMENT EXPERIMENTS

**KEY QUESTIONS:**

- WHAT IS THE TECHNICAL PURPOSE AND PHASING OF THE PA AND OD?
- WHAT SHOULD BE DONE TO ENSURE OPERATIONAL READINESS FOR THE OD?
- WHAT IS THE RELATIONSHIP OF WIPP TO THE DEFENSE NUCLEAR MATERIALS PROGRAM?

*WHAT IS THE TECHNICAL PURPOSE AND PHASING OF THE PA AND OD?*

**RECOMMENDATION B.1:**

- SEPARATE THE WIPP TEST PLAN INTO THE TWO DISTINCT PARTS (PA AND OD) AND CLEARLY DEFINE THE GOALS FOR EACH
- START THE PA AT WIPP AS SOON AS THE LAW PERMITS
- START A LESS-THAN-FULL SYSTEM OD BEGINNING WITH THE EMPLACEMENT OF PA WASTE
- TECHNICALLY START A FULL-SYSTEM OD WITH THE FILLING OF THE BACKFILLED ALCOVE TESTS AND TIME FULL-CAPACITY TESTING TO BRIDGE WITH THE START OF WIPP DISPOSAL OPERATIONS
- SCOPE THE OD TO DEMONSTRATE TECHNICAL GOALS OF FULL-SCALE TRU/MIXED TRU WASTE MANAGEMENT TEST

*WHAT SHOULD BE DONE TO ENSURE OPERATIONAL READINESS FOR THE OD?*

**RECOMMENDATION B.2:**

- IDENTIFY ALL STATUTORY, REGULATORY, AND TECHNICAL REQUIREMENTS TO EXECUTE THE OD
- CONDUCT A READINESS REQUIREMENTS REVIEW USING A FORMALLY TASKED MULTIDISCIPLINARY REVIEW GROUP

*WHAT IS THE RELATIONSHIP OF WIPP TO THE DEFENSE NUCLEAR MATERIALS PROGRAM?*

**RECOMMENDATION B.3:**

- ISOLATE WIPP, AS MUCH AS POSSIBLE, FROM THE OPERATIONAL REQUIREMENTS OF THE DEFENSE NUCLEAR MATERIALS PRODUCTION PROGRAM
- DEVELOP A TRU/MIXED TRU WASTE STORAGE PLAN TO ADDRESS THE DEFENSE NUCLEAR MATERIALS PRODUCTION WASTE STORAGE ISSUE
- DEVELOP A PREAPPROVED RETRIEVAL AND STORAGE PLAN IF WIPP IS PROPOSED AS A TEMPORARY STORAGE FACILITY FOR CURRENT RFP PRODUCTION WASTE

FIGURE 3: THE MAJOR TRU/MIXED TRU WASTE MANAGEMENT PROGRAM ISSUES

**IMPORTANT FINDINGS**

THE FINDINGS OUTLINED ON THE FOLLOWING PANELS CONTRIBUTE IN A MAJOR WAY TO THE CURRENT WIPP DILEMMA AND THE SPECIFIC BLUE RIBBON PANEL ISSUES.

- *THE WIPP TEAM IS IMPORTANT TO THE PROPER AND SAFE EXECUTION OF THE TEST PLAN*
- *THE WIPP PROGRAM ADDRESSES THREE MAJOR NATIONAL ISSUES*
- *A MIXED WASTE MANAGEMENT POLICY AND STRATEGY ARE NEEDED*
- *THE MANAGEMENT OF THE MIXED WASTE PROGRAM SHOULD BE RESTRUCTURED*

*THE WIPP TEAM IS IMPORTANT TO THE PROPER AND SAFE EXECUTION OF THE WIPP PROGRAM*

RECOMMENDATION C.1:

- ASSESS THE IMPACT OF WIPP PROGRAM DELAYS ON TEAM EFFECTIVENESS AND PERSONNEL RETENTION

*THE WIPP PROGRAM ADDRESSES THREE MAJOR NATIONAL ISSUES*

RECOMMENDATION C.2:

- SEPARATE THE THREE ISSUES – DEFENSE MATERIALS PRODUCTION, MIXED WASTE REGULATION, AND WIPP FACILTY DEVELOPMENT
- ADDRESS EACH ISSUE ON ITS OWN MERIT
- IDENTIFY EXPLICITLY THE COMMON ISSUES OF CONCERN AND THE TRADE-OFFS

*A MIXED WASTE MANAGEMENT POLICY AND STRATEGY ARE NEEDED*

RECOMMENDATION C.3

- DEVELOP A NATIONAL MIXED WASTE MANAGEMENT STRATEGY
- WORK COOPERATIVELY, AT AN ACCELERATED PACE, WITH EPA TO DEVELOP A COHERENT MIXED-WASTE REGULATORY FRAMEWORK (INDEPENDENT OF THE WIPP PROJECT)

FIGURE 3: THE MAJOR TRU/MIXED TRU WASTE MANAGEMENT PROGRAM ISSUES (CONT)

***THE MANAGEMENT OF THE MIXED-WASTE PROGRAM SHOULD BE RESTRUCTURED***

**RECOMMENDATION C.4:**

- ESTABLISH A FULL-TIME TRU/MIXED TRU WASTE MANAGEMENT OFFICE AT HQ WITH THESE SUBFUNCTIONS:
  - STRATEGIC PLANNING AND REQUIREMENTS
  - WIPP PROGRAM
  - WIPP WAC CONFIGURATION MANAGEMENT
  - WIPP WAC AUDIT OFFICE
  - WIPP WASTE INFORMATION SYSTEM

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## RECOMMENDATION A.1:

*DOE should separate the WAC approval authority from the WAC Certification and Audit functions. A TRU/Mixed TRU Waste Acceptance Criteria Configuration Management Board (WACCMB) should be established to review and approve the WAC and modifications to it. The WACCMB should report to the person responsible for DOE's TRU/Mixed TRU Waste Management Program to affix accountability. The WIPP WAC Certification Committee (WACCC) should be rechartered to certify and audit the WAC certification process employed at the generation and storage sites.*

## DISCUSSION A.1:

WIPP safety and the management and integrated control of DOE's TRU/Mixed TRU Waste Management Program are based on the WAC and the WIPP Waste Information System (WWIS). The WAC development, approval, and modification process should be independent from the certification and audit function, the WIPP Program, and the generation/storage sites. A separately chartered WACCMB reporting to a single individual responsible for managing the DOE TRU/Mixed TRU Waste Management Program would provide this independence.

The present WAC does not integrate TRUPACT II requirements, the PA parameters, agreements with the State of New Mexico, and RCRA requirements. The WAC and TRUPACT II requirements differ, and the current RCRA requirements are not incorporated in the WAC. Coordination with the New Mexico Environmental Improvement Division (EID) is necessary to ensure regulatory consistency between the WAC, the State EPA-equivalent licensing requirements, and the terms of agreements with the State of New Mexico. Presently, there is inadequate integration of the WAC and the definition of the physical characteristics of the waste source term used in PA analyses. Previous PA and Safety Analyses have treated hazardous materials separate from radioactive ones. For example, the current PA does not assume hazardous materials as contaminants (except for lead); it ignores the waste liquids as a potential carrier medium; and it does not consider various volatile organic compound (VOC) transport mechanisms.

The WAC is the integrating document that ultimately establishes the physical character of the WIPP source term and, hence, is an important factor in the long term safety of the facility.

## 2. Is the TRU/Mixed TRU waste certification process adequate?

## OBSERVATION A.2:

The current waste certification process uses process knowledge to characterize hazardous waste streams. The process knowledge methodology tends to classify mixed wastes conservatively. Current hazardous waste data are based on a few samples of waste package analysis. The Real-Time-Radiography (RTR) operation is the most subjective aspect of the certification process and requires well-trained technicians.

## RECOMMENDATION A.2:

*RFP should, as part of its routine QA function, physically sample certified waste drums on a random basis to ensure compliance with the WAC and verify RTR certification. During the sampling, additional hazardous material data should be gathered. Hazardous waste assay instrumentation should be developed to better document the hazardous waste component. Assay instrumentation should be cross-calibrated among operating sites. RTR operator performance should be routinely* *assessed. Furthermore, the current RTR operators should be evaluated to determine what individual skills are required to maintain a high level of performance. This study will provide a basis for future RTR training, selection, and certification of candidate technicians.*

**DISCUSSION A.2:**

There is an inconsistency of technical effort, waste characterization, and data as it pertains to the radioactive and hazardous waste components of the TRU/Mixed TRU wastes.

The methodology for long-term radioactive waste disposal safety evaluation requires a performance assessment with potential human intrusion; whereas, RCRA requirements are being met based on a successful No Migration Petition (NMP) which does not model human intrusion. If the NMP is denied or substantively challenged, quantitative data are inadequate to support a detailed RCRA safety and health analysis. Except for sludges, current waste is RCRA type classified based on process knowledge using very conservative estimates for hazardous material content. Given the risks and technical difficulties in obtaining representative data, process characterization is a reasonable methodology, but nondestructive hazardous materials assay methodologies should be investigated to increase the available data.

Furthermore, if these conservatively estimated quantities of hazardous materials are present in the source term, detailed analyses of potential leakage from the disposal site do not consider the liquid components as adding to the total liquid volume nor as hazardous components in long-term safety studies. Current PA analyses do not consider the hazardous material, except lead, as potential contaminants for safety analysis.

The data establishing hazardous material quantities are based on a few sampled drums (not including sludges). All waste drums are being vented, and this process may provide an opportunity to sample the volatile compounds in the drum head space. The gas data could provide the basis for estimating the VOC content.

At present, RFP does not routinely open drums to supplement the nonintrusive certification procedure. Additionally, at RFP (as at SWEPP), the certification process depends on the subjective judgement of the RTR technician. This and the process knowledge waste classification methodology are the most subjective aspects of TRU/Mixed TRU Waste certification. Over the past four years, RTR technicians have compiled an outstanding record. QA checks of RTR tapes are made for one in three certified and for all uncertifiable drums. QA has yet to dispute the judgement of the on-line RTR technician. Notwithstanding this exemplary record, the prerequisite skills and work load/functions required of an RTR technician to maintain this quality standard should be documented.

3. **Is the WIPP Waste Information System (WWIS) data base accurate?**

**OBSERVATION A.3:**

The WWIS is central to effectively execute the TRU/Mixed TRU Waste Management Program. Local data management systems that feed WWIS were developed to meet individual operating needs and conditions. Substantial data are manually entered into the local data bases. No consistent security or QA standard is applied to the total (local and WWIS) system.

**RECOMMENDATION A.3:**

*A security and QA review of the WAC Program, especially the WWIS and local waste management data bases, should be conducted to assess its vulnerability to deliberate malfeasance* *and sabotage and to reduce the potential for human transcription error. Methods to automatically transfer WAC data during the certification process should be considered. Finally, waste package data should be verified upon receipt at WIPP. An easily measured parameter, such as weight, could be used.*

**DISCUSSION A.3:**

The WWIS is central to the effective execution of the TRU/Mixed TRU Waste Management Program. The WWIS contains the data for the certified TRU/Mixed TRU waste, and is the coordinating link in transferring this waste between generation, storage, and transportation and ultimately to the WIPP. After the waste package is certified and labelled, there is no verification step to ensure that the package and the data base entry are consistent and that gross package content changes have not occurred.

The WWIS receives data from various local generating and storage site data bases. For example, the local data base at RFP evolved over many years to meet operational requirements without regard to consistency with WIPP requirements. The current RFP system user passwords are permanently assigned, a carry over from an earlier working procedure. Although a security standard has been implemented for the WWIS, there is no consistent security standard applied to the total system, comprised of this variety of data bases.

Currently, RFP waste certification technicians manually enter data developed during the waste package certification process. A waste certifier verifies each entry by comparing the process data sheets and the data file. Although independent checks are being accomplished (RFP is upgrading its system to automate data entry), manual data entry is a potentially large source of inadvertent or deliberate error.

4. **Is the WIPP WAC Quality Assurance Program managed and executed effectively?**

**OBSERVATION A.4:**

There was insufficient time for the panel to fully review the WIPP WAC Quality Assurance Program.

**RECOMMENDATION A.4:**

*The WIPP WAC Quality Assurance (QA) Program should be reviewed by an independent body. It could be a potential future BRP agenda item or could be accomplished by an outside Federal agency, e.g., the National Bureau of Standards.*

**DISCUSSION A.4:**

The WIPP WAC QA serves as an important safeguard to ensure that the characteristics of the wastes repository source term remain consistent with the WAC criteria and with the parameters assumed for the PA analysis. Furthermore, Federal and state agencies will regulate the waste package contents.

5. **What should the major elements of the validation plan for the RFP-certified wastes be based on?**

**OBSERVATION A.5:**

Recertifying the RFP TRU/Mixed TRU wastes should accomplish two objectives: (1) proper technical certification of the RFP wastes based on the WIPP WAC; and (2) assuring the public that the certification process is properly conducted.

**RECOMMENDATION A.5:**

*Recertification of the RFP TRU/Mixed TRU waste must be executed in a manner that is technically correct and which incorporates random physical inspection of the waste packages. Results should be made public. An unannounced audit of the RFP WAC certification process and waste records should be performed, and there should be a full-time presence of the WACCC audit team and a representative of the state regulatory agency during the recertification process. The actual recertification should be conducted by other than the RFP generating contractor and include a 100-percent QA check on all RTR tapes.*

**DISCUSSION A.5:**

The RFP mixed-waste recertification dilemma has been caused, in part, by the change in the definition of TRU waste (lower limit changed upward from 10 nCi to 100 nCi per gram), the availability of more sensitive assay instrumentation, and the RFP practice of conservatively classifying the waste. The current estimate is that 10 percent or more of the RFP TRU/Mixed TRU waste at RFP, and a larger fraction of the RFP wastes at INEL, will be reclassified LLW/mixed LLW.

To improve the acceptability of the recertification results, the following are also proposed:

(1) An on-site WACCC Audit Team consisting of appropriate outside representation should monitor the total waste recertification process at RFP;

(2) Appropriate state regulatory and technical experts should be briefed and also observe recertification;

(3) An unannounced audit of RFP TRU/Mixed TRU waste records should be conducted specifically for technical accuracy and potential malfeasance;

(4) The RFP waste certification procedures and supporting waste information system should be reviewed to assess existing security measures;

(5) Calibration of all recertification systems, e.g., assay equipment, should be traceable to an appropriate standard and should be cross-calibrated between INEL SWEPP and RFP facilities;

(6) A 100-percent review of all RTR records of currently on-site RFP TRU/Mixed TRU waste should be conducted by INEL SWEPP or another qualified facility. The RTR tapes for each drum should be compared on an A-B basis--original certification versus recertification, with appropriate salting to ensure quality control. Furthermore, appropriate chain-of-custody rules must be established for all tapes;

(7) A predetermined number of all RFP waste containers should be opened to verify the waste classification;

(8) The RFP waste management system audit should be based on a limited-access audit plan;

(9) The objectives of the RFP waste recertification program should be made public and include proposed actions to improve the process; and

(10) The governors of Colorado, Idaho, and New Mexico should be briefed on the recertification plan, its objectives, and results.

## B. The Performance Assessment and Operations Demonstration Sequence in the Overall WIPP Test Plan

The sequence of the OD vis-a-vis the PA in executing the WIPP Test Plan raises the four issues that are addressed below:

### 1. What is the technical purpose of the PA and OD Tests, and what should their execution phasing be?

**OBSERVATION B.1:**

As depicted by the briefings and documents, the PA experiments are designed to obtain the data for the final design of the WIPP and the supporting PA analysis for compliance with 40CFR191/286. Presently, the data are inadequate to accomplish final WIPP design. The full TRU Waste Management Systems OD test will assess the proper integration of the certification/packaging, transportation, and disposal subsystems, and operator training performance. The less-than-full system OD will begin with the insitu PA experiments. The full-system OD, an equivalent sub-scale WIPP demonstration, begins with the last two alcove tests that will be backfilled.

**RECOMMENDATION B.1:**

*The WIPP Test Program should be divided into two distinct parts -- PA and OD -- with the objectives for each clearly identified. The insitu PA tests and experiments with actual waste should start as soon as the law permits. Based on technical reasons only, the planned start of the full-system OD should occur when the WIPP design is analytically finalized and the PA analysis based on this design meets the requirements of 40CFR191/286. The technical start of the full-system OD should begin with filling the backfilled alcoves. The scope of the system OD should be established to demonstrate that the TRU Waste Management System works as expected. The final ramp-up to full-scale operational rates should occur to blend naturally with the start of WIPP full operations. DOE should consider that a potential outcome of the PA might be that compliance with 40CFR191 cannot be reasonably achieved unless the waste is processed.*

**DISCUSSION B.1:**

The WIPP facility is by far a safer concept for long term disposal than any of the current surface or near-surface storage facilities for TRU/Mixed TRU wastes. Furthermore, the technical and safety issues facing the WIPP Program are solvable with today's technology, but data are necessary to solve the technical issues.

The PA tests and experiments phase is intended to demonstrate the technical feasibility of the project and to establish the detailed WIPP disposal concept. Insufficient data are available today to specify the final design incorporating the five barriers that influence the release of waste materials from WIPP to the biosphere--the salt bed, the waste form, the aquifer, the prevention of inadvertent human intrusion, and the quantity of waste at risk if the salt barrier is breached. Until the design criteria and the credit allocable to each of these barriers are established and a safety analysis that meets 40CFR191

Part B (or its equivalent) is completed, the technical feasibility of the WIPP facility concept will not have been demonstrated. The PA goal is to establish the basis for the WIPP design that can be demonstrated in a subsystem OD.

The OD portion of the WIPP Test Program is a systems test of the TRU/Mixed TRU Waste Management System. The OD is very important to demonstrating that the waste management system is properly integrated, it can operate effectively, and it will operate safely. This system consists of three subsystems: waste packaging and classification; waste transportation; and WIPP operations. Each of these subsystems can be tested individually. In fact recertification of the RFP TRU/Mixed TRU waste is a limited scope OD of a generator and a storage site. Thus, two subsystems and a portion of the third subsystem will be operationally tested during the PA phase of the WIPP Test Program. Only the final room configuration, waste form, and anti-intrusion elements will not be tested. The technical start of the OD should coincide with the beginning of the last two alcove tests when the engineered modifications and backfill are incorporated with the waste package emplacement.

Until sufficient data are obtained during the PA portion of the WIPP Test Program and the final engineered modifications are completed, moving additional waste to the WIPP site incurs the risk of future retrieval, relocation, and processing and the associated loss of public credibility. There is a much smaller risk to public safety associated with transportation to the WIPP site. The degree of acceptable risk is a management decision. The real risk is public credibility. Moving the waste to a facility whose safety is not demonstrated analytically will be based largely on a "trust me" argument. Additionally, the acquisition of new knowledge and the ever-changing regulatory environment may require substantial modification of the WIPP disposal concept. This will result in further erosion of public confidence in the WIPP.

Even with the completion of the PA portion of the WIPP Test Program, there will be risks in beginning the movement of waste to WIPP. The slow processes that occur in the salt bed which enhance the long-term safety of the repository concept also require analysis and validation over a substantial time period: 100 to 200 years until the site achieves lithostatic equilibrium. Beginning with the PA, and continuing through the OD and full operations, there should be a test program to monitor filled rooms and provide early warning of potential problems. There will always be the concern for unexpected and unpredictable behavior of the repository even beyond the five-year test program (Consultation and Cooperation Agreement).

Finally, DOE should consider that a potential outcome of the test program might result in the conclusion that there is no reasonable way to demonstrate compliance with 40CFR191 without extensive modification. If the salt disposal concept is one of the safest geologic disposal options available (NRC-NAS 1957 and subsequently), what alternatives are available to remedy the current near-surface storage situation?

2. What should be done to ensure operational readiness before and during the OD?

**OBSERVATION B.2:**

The complex issues surrounding the WIPP Program necessitate a broad-based demonstration readiness program. It encompasses technical, systems, legal, regulatory, management, training, safety, and recovery planning.

**RECOMMENDATION B.2**:

*A formal multidisciplinary review of the WIPP Program Operational Readiness requirements should be conducted.*

**DISCUSSION B.2**:

No single individual can reasonably verify that all the OD readiness requirements have been identified and that the current plan has considered all the potential issues that could arise. A multidisciplined team of legal, regulatory, technical, safety, transportation, and Federal and state experts will be required to reasonably conduct such a review. The current status of the WIPP Program suggests a need for this review.

3. **What is the relationship between WIPP and the Defense Nuclear Materials Production Program?**

**OBSERVATION B.3**:

The WIPP development program is unnecessarily burdened by the perceived requirement to store operational TRU/Mixed TRU wastes in support of nuclear materials and weapons production.

**RECOMMENDATION B.3**:

*DOE should separate WIPP from the operational defense nuclear material production program and develop a TRU/Mixed TRU Waste Storage Plan separate from the WIPP Test Plan.*

**DISCUSSION B.3**:

Public Law 96-164 authorizes WIPP as "providing a research and development facility to demonstrate the safe disposal of radioactive wastes...." Further, the Consultation and Cooperation Agreement between DOE and the State of New Mexico establishes a five year test period during which the WIPP cannot be operated as a disposal facility. Prematurely incorporating WIPP into the defense nuclear materials production program jeopardizes the success of WIPP as a R&D demonstration project.

The TRU/Mixed TRU waste storage plan may include the WIPP facility. If WIPP is included, an agreed upon retrieval and temporary storage plan must be established among all involved parties to designate temporary storage facilities before implementation.

## C. The Major TRU/Mixed TRU Waste Management Program Issues

1. **The WIPP Team is important to the proper and safe execution of the WIPP Program.**

**OBSERVATION C.1**:

A motivated and well trained WIPP Technical, Operations, and Management Team is essential to the success of the Program.

**RECOMMENDATION C.1:**

*DOE should assess the personnel impacts of delays in the WIPP Program.*

**DISCUSSION C.1:**

The WIPP Team has prepared itself technically and organizationally for a 1989-90 start to demonstrate an important national project. Circumstances beyond their control could delay this start, perhaps for many years. The retention of the highly trained and motivated team will be an important factor to the successful and safe execution of the test and evaluation phase of the WIPP Program. If a significant period of time lapses between the Test Phase and full operations, the OD results may be rendered inappropriate.

2. **The WIPP Program is attempting to address three major national issues.**

**OBSERVATION C.2:**

The WIPP Program is faced with three major national issues: developing WIPP, establishing a workable set of mixed waste regulations, and supporting defense nuclear materials production.

**RECOMMENDATION C.2:**

*DOE should separate the three issues and address each independently. The items common to two or more programs should be identified. Common issues can be solved for the common good; but the common items should be deliberately assessed, and the options specifically addressed to define the trade-offs that will occur.*

**DISCUSSION C.2:**

The TRU/Mixed TRU Waste and WIPP Program is embroiled in three significant and conflicting requirements: developing a geologic disposal facility for nuclear waste, defining the mixed-waste regulatory requirements, and supporting a TRU/Mixed TRU waste management program to meet defense nuclear weapons production requirements. The Program does not have the management resources to adequately execute this complex, internally-conflicting program. Furthermore, a single solution to resolve these conflicting requirements is fraught with inconsistencies and jeopardizes the successful execution of the WIPP Program.

On the other hand, these three issues are intertwined and have intersections that are of common concern. An approach DOE might elect to pursue would be to identify all such items of common concern, then address each item explicitly and develop alternative solutions by identifying the trade-offs and impacts on each issue. A good start at systematically ordering these issues was provided to the BRP as a large graphic accompanying the Draft Decision Plan for WIPP, Revision 0, October 11, 1989.

3. **A Mixed Waste Management Policy and Strategy are urgently needed.**

**OBSERVATION C.3:**

The historic focus of the WIPP, WAC, PA, and DOE has been on the radiological hazards associated with TRU/Mixed TRU waste. The WIPP is establishing a regulatory precedent for managing mixed waste. This precedent will affect the commercial power industry at the HLW repository project, current low-level mixed-waste storage and disposal sites and future options. Establishing mixed-waste regulations has a broader impact on national policy than just the WIPP Program.

**RECOMMENDATION C.3:**

*DOE should establish an Office for Mixed-Waste Management and Policy and accelerate efforts to reconcile, with EPA, the differences between the RCRA and Radioactive Waste management regulations and develop a coherent DOE policy for managing and disposing of all US mixed-waste, commercial and defense. This office should be independent from the WIPP Program.*

**DISCUSSION C.3:**

There is a fundamental conflict of interest in permitting the needs of the WIPP Program to drive the mixed-waste regulatory discussion. These regulations should be addressed from the national standpoint. Mixed-waste regulations will affect LLW disposal and storage and the HLW repository project. Future commercial nuclear power may use mixed fuels. Determining the future of this important regulatory arena based solely on a current program need is nearsighted.

4. **Management of the TRU/Mixed TRU Waste Program should be restructured.**

**OBSERVATION C.4:**

The management structure of DOE's TRU/Mixed TRU Waste Management Program is not clearly defined and is inadequately staffed to provide dedicated, coherent top-level program direction. Indicators are that there is no coherent strategy or systems integration function for the TRU Waste Management Program to successfully transition WIPP from a research and development project to a waste disposal facility. As a result, there is an appearance of reactive rather than proactive program execution to achieve DOE TRU/Mixed TRU Waste Management goals.

**RECOMMENDATION C.4:**

*DOE should establish a TRU/Mixed TRU Waste Program Office staffed, resourced, and chartered to manage this program. This office should be organized to establish a strategic planning and requirements function, the WIPP Development Program (i.e., the R&D, facility construction and operations, and safety analysis/EIS documentation), the WIPP WAC Configuration Management Board, the WIPP WAC Audit Office, and the Mixed Waste Information Systems Office.*

**DISCUSSION C.4:**

The importance of WIPP to the national defense and the nuclear power industry cannot be overstated. Its success facilitates the execution of future defense programs, establishes an important milestone in the safe geologic disposal of nuclear waste, and indicates reconciliation of current conflicting environmental regulations governing mixed-waste.

During the past few years, the legal and operating requirements for WIPP have changed substantively, causing programmatic and technical redirection. The complexity of this management task has challenged DOE; there are indications that the program leadership has continually been placed in the position of responding rather than leading. Each of the program functional areas demonstrates consistent and excellent technical knowledge, motivation, and dedication; however, more active management, integration, and planning would benefit the program. The following are examples of WIPP Program items where improvements can be made:

(1) A coherent, long-term schedule and detailed requirements statement for the TRU/WIPP Program;

(2) An active plan to work with the New Mexico Environmental Improvement Division (EID) to ensure that future regulations are consistent with the approved waste form (WAC);

(3) A formal risk assessment of the TRU/WIPP Program that identifies key issues with associated management action plans to resolve these issues;

(4) A clear definition of the PA and OD technical goals, separate from the nuclear materials production requirements;

(5) A Management Plan to take the TRU/WIPP Program through its various phases to eventual closure;

(6) A vigorous and proactive initiative to resolve the Mixed Waste Issue at the Inter-Agency Level;

(7) An integrated WAC process that formally incorporates input from the PA Analysis, the TRUPACT II requirements, the C&C Agreement, and the potential effect New Mexico RCRA regulations may have on the WIPP as a disposal facility;

(8) An aggressive effort to reconcile, with EPA, the mixed-waste regulations to meet national needs; and

(9) A coordinated WIPP retrieval and storage plan.

## Appendix A

## LIST OF REFERENCES

## Appendix A

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*Appendix B*

## BLUE RIBBON PANEL
## QUESTIONS
## FOR
## SEPTEMBER 25-26, 1989 MEETING

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### 1. ORGANIZATIONAL RELATIONSHIPS

a. Who is the single person at DOE HQs who is in charge of WIPP, and TRU and Mixed TRU waste management? (Kubo)

b. What is the line management organization beginning with the single person identified in 1.a. (DOE HQs) to the WIPP Principle contractors, e.g. Westinghouse, Sandia, Bechtel, etc? Clearly establish the TRU/Mixed TRU Waste Management Configuration Control Manager, the WIPP Engineering Change Proposal Approving Authority, and the Performance Assessment, QA/QC and the Waste Acceptance Criteria (WAC) Functions within the organization. (Kubo)

c. What is the line management relationship between the TRU waste generators and the WAC Certification Committee (WACCC)? Is there a DOE Order that requires TRU waste generators to comply with the WAC? What is the authority of the WACCC to conduct unannounced onsite audits of TRU/MIXED TRU WACC? (Kubo)

d. Who is the approving authority to modify process/production lines that generate TRU wastes? (Kubo)

e. What is the DOE practice to respond to comments made on the WIPP program (e.g., GAO and EEG testimony at 6/12/89 Synar Subcommittee hearing; the NAS 1984 report)? (Bishop)

f. Who has the authority to begin the Performance Assessment and Operations Demonstration (GAO at the 6/12/89 Subcommittee hearing stated that only Congress could approve; EEG stated that compliance with 40 CFR 191 Subpart A must be determined prior to commencement of the Operations Demonstration)? (Bishop)

g. If the Performance Assessment concludes that some type of waste segregation is important at the generating sites for overall system viability, does the WACCC have the authority to implement those requirements? If not, who does? (Bishop)

h. Has an evaluation of Rocky Flats Plant waste generation been undertaken on an integrated systems engineering basis (i.e., treating the waste as a product line)? Do waste activities compete with product activities for budget dollars? (Bishop)

i. Wouldn't membership on the WACCC of appropriate representatives from INEL and RFP better ensure the integration and coordination of activities and the implementation of a "no surprises" doctrine? (Bishop) As a follow-on, shouldn't the WACCC be chartered by DOE and have all generating sites represented? Clearly the WACCC is the configuration control group for TRU/Mixed TRU. (Kubo)

j. Why isn't waste treatment and disposal a component of DOE's determination at RFP and other manufacturing facilities of the Economic Discharge Limit (EDL)? (Bishop)

k. Are the DOE responses to the EPA questions regarding the No Migration Variance Petition being coordinated with the revision to the Supplemental Environmental Impact Statement and the Final Safety Analysis Report? (Bishop)

l. Please identify all the methods and locations currently used by DOE to store TRU and Mixed wastes? (Squyres)

m. What are the pros and cons (comparative costs and benefits) associated with continuing to store TRU and mixed wastes at the locations and with the methods set forth above, including regulatory, safety, national security and environmental issues? (Squyres)

n. What DOE organization is responsible for developing the WIPP waste retrieval plan? Is the approval of this plan on the critical path for the decision to ship waste to WIPP for experiments and the operations demonstration? (Slosky)

## 2. THE LEGAL BASIS AND REQUIREMENTS FOR WIPP

a. What is the legal basis to establish WIPP? What special or unusual authority was given DOE to design, construct, activate and operate/maintain WIPP? (Kubo)

b. What are the legal requirements for WIPP to begin the in-ground Performance Assessment (PA) experiments with actual wastes? (Kubo)

c. What are the RCRA and EPA requirements that WIPP must meet to begin the Operations Demonstration (OD)? Routine Operations and Maintenance? How does the No-Migration Petition fit into this? (Kubo)

d. How will the anticipated PA requirements differ from the remanded version of 40 CFR 191? (Kubo)

e. Has DOE evaluated the opportunity provided in 40 CFR Section 191.17 to advocate WIPP-specific criteria because of the unique characteristics of TRU waste and the WIPP facility? (Bishop)

f. Have any policy discussions been held with EPA to discuss the possibility that failure to meet the disposal standards of 40 CFR 191 (which may be without technical justification and thus arbitrary) will result in temporary storage for an indefinite period of time (which would provide a much greater hazard to the environment)? (Bishop)

g. Who at DOE is responsible for identifying statutory and regulatory requirements pertaining to WIPP and ensuring, on an integrated basis, that all WIPP related activities comport with those requirements? (Bishop)

h. Where and how is data on hazardous materials going to be collected and analyzed to satisfy RCRA requirements? (Bishop)

i. There appears to be a significant conflict between the EPA's regulation of (1) TRU waste; (2) hazardous waste; and (3) mixed wastes. How has DOE addressed this problem internally and with other members of the Executive Branch? (Squyres)

j. From a legal standpoint, can waste be put underground at WIPP before compliance with 40 CFR 191 Part B is demonstrated? (Slosky)

k. What type of RCRA Part B permit is required for WIPP? What other EPA permits (e.g., Safe Drinking Water Act) are required for WIPP? (Slosky)

l. Can land-banned wastes continue to be generated by DOE if the no migration petition is not approved? (Slosky)

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## 3. THE METHODOLOGY TO REDUCE TECHNICAL UNCERTAINTY

a. What are the key technical issues that must be resolved to meet the PA and RCRA requirements for an operational WIPP? Which are known and what are uncertain? (Kubo)

b. What is the research plan to address the key technical issues identified above? (Kubo)

c. Explain the rationale for the room test if the waste drum positioning and the backfill composition will not resemble an operational configuration. Specifically, how do you assess the data obtained to extrapolate it to the actual waste disposal configurations and over time periods of 200 years. (Kubo)

d. Describe the areal extent of the mixing cell to assess the total release of hazardous and TRU materials to the environment. What portion of the repository is assumed to be the source term for the 10,000 year human intrusion scenario? (Kubo)

e. Has an analysis been made of the uncertainties identified in the data, models and analysis to date to ensure that the Performance Assessment Test Program is correctly focused at reducing those uncertainties to acceptable limits in support of the Performance Assessment? (Bishop)

f. Is DOE evaluating the technologies available to determine the hazardous material and organic components of each TRU Waste stream or package if either of those categories of materials become important in terms of the Performance Assessment or the facility's ability to comply with RCRA? (Bishop)

g. Is the WACCC requirement that generating sites estimate organic material to the nearest 10% sufficiently accurate for the site suitability analysis? Is the Performance Assessment evaluation using a probabilistic risk assessment for organic content? (Bishop)

h. Has the use of standard mixtures and weight percentages of radionuclides, as developed by INEL, been validated against actual waste being generated and has it been subjected to independent Quality Assurance assessment? Is the data consistent with the data being utilized in the SEIS, FSAR, No Migration Variance Petition, and Performance Assessment? (Bishop)

i. If the laboratory test described in DOE/WIPP 89-011, 2-84, will "bracket the times and conditions of interest for each important gas for 10,000 years," why does waste characterization, both as to radionuclides and non-radioactive materials, matter? (Bishop)

j. Has thought been given to using a supercompactor to simulate the salt creep and the resulting lithostatic pressure to which the waste will be subjected in WIPP? (Slosky)

k. What quantity of waste is needed for the bin-scale and the alcove-scale tests? What portion of the waste is scheduled to come from RFP and INEL? (Slosky)

l. Is RH waste needed for underground experiments at WIPP? If not, how will the performance of RH waste be assessed? (Slosky)

m. What technical information will the alcove-scale tests provide that the bin-scale tests will not? (Slosky)

n. Why can compliance (with 40 CFR 191 Part B) of the high-level waste repository be demonstrated without placing waste underground, when waste must be put underground to demonstrate WIPP's compliance? (Slosky)

o. What is the current thinking on the type of backfill to be used? What experiments (at WIPP or elsewhere) are planned to evaluate alternative backfill materials? (Slosky)

p. What is the current thinking on the types of room and shaft seals to be used? What experiments (at WIPP or elsewhere) are planned to evaluate alternative sealing approaches? (Slosky)

q. What is the current thinking on potential engineering enhancements? What experiments (at WIPP or elsewhere) are planned to evaluate alternative engineering enhancements? (Slosky)

r. What is the schedule for decisions on backfill, room and shaft seal and engineering enhancements? When will such decisions be incorporated into the PA? (Slosky)

s. What approaches are being used to determine the permeability of the collapsed waste rooms? (Slosky)

t. What is the sensitivity of the PA results to aqueous and organic liquids in the wastes? (Slosky)

u. Under the 3 or 5 year test plan, will the bin-scale and the alcove-scale test run long enough to produce sufficient data on gas generations? (Slosky)

## 4. THE INTERRELATIONSHIPS BETWEEN THE WAC, PA AND NO MIGRATION PETITION (NMP)

a. Define the legal and technical interrelationships between the WAC, PA and NMP? (Kubo)

b. What is the management plan to integrate the legal and technical compliance interrelationships between the WAC, PA and NMP? (Kubo)

c. What are the parameters assumed for the TRU/Mixed TRU source term for the PA calculations, e.g., initial and final conditions for density, initial hazardous and radioactive waste inventories, liquid content, etc? Additionally, what is the source for the data used to establish the source parameters? (Kubo)

d. How does DOE intend to address the inconsistencies between the No Migration Variance Petition and the Performance Assessment? (Bishop)

e. What mechanisms are in place to ensure the coordination of the Waste Acceptance Criteria with the facility operational analysis being undertaken to support the Performance Assessment (e.g., WAC allowance of 1% free liquid, compaction ratios to be achieved by RFP super compactor)? (Bishop)

f. What studies have been done to assess the long-term (200 year) performance of solidified waste forms? (Slosky)

g. What studies are currently underway and planned regarding waste treatment and the performance of treated waste forms in WIPP? How will the results of these studies be incorporated in the PA? (Slosky)

h. How will the fact that the WACCC can grant exemptions from the WAC be accounted for in the PA and the NMP? (Slosky)

i. What is the time schedule for the PA and the RCRA Part B application, and how do these relate to the various activities producing the data needed for the PA and the RCRA permit? (Slosky)

j. What is the difference between the PA and the consequence analysis? (Slosky)

k. How is criticality considered in assessing the performance of WIPP? (Slosky)

5. THE WAC CERTIFICATION (WACC), QA/QC AND SECURITY

a. Describe the WACC QA/QC procedures. Based on current WAC procedures, describe the range of uncertainties in percent of the nominal value for each measured WAC item, e.g. weight, fissile material content, hazardous material content, curie content, material species, etc. How are the range of uncertainties verified? (Kubo)

b. Describe the basis for each WAC item, the specific safety issue it addresses and why the limit was established. (Kubo)

c. Describe the procedures in place today that ensure the security of the WAC data base. For example, password control, administrative controls, etc. (Kubo)

d. Describe the experiments that validate the use of the carbon-carbon vent filters on the drums as it pertains to filter degradation with moisture and moisture entering the drum due to normal pressure differential aspiration. Once these vents are installed, how long can the drums be stored without a verification that the drum contents remain the same? (Kubo)

e. Are independent and routine reviews of the RTR tapes conducted to verify the quality of each operator? (Kubo)

f. The Waste Acceptance Criteria identifies 18 Quality Assurance program elements, yet it states that all 18 are not applicable to each Site Certification Plan. Why aren't they? (Bishop)

g. What evaluation was done to validate the Waste Acceptance Criteria against the requirements of 49 CFR 173 for Type A packages? (Bishop)

h. Does the WACCC intend to use its annual generating site audits to develop data that might be useful in trend identification and analysis of personnel and equipment performance? (Bishop)

i. Why aren't package specific records required to be retained post-emplacement to facilitate any problem resolution if it occurs (WIPP/DOE-120 P.13)? Similarly, why aren't certification records maintained beyond a subsequent audit so as to provide an ability for the WACCC to trend equipment degradation or programmatic weaknesses (WIPP/DOE-120, 12)? (Bishop)

j. If all generating site plans require the use of plastic liners, why doesn't the Waste Acceptance Criteria mandate their use (WIPP/DOE-114, Criterion 4.6)? (Bishop)

k. Why aren't specific requirements imposed by the WACCC regarding the number and location of labels to aid in potential package retrievability as well as to facilitate operations and associated quality assurance? (Bishop)

l. The Waste Acceptance Criteria specifies that no liquid waste form is acceptable, but allows minor liquid residue. This is apparently interpreted in practice to mean up to 1%; further conversations at INEL and RFP suggest that there was some correlation between the level allowed by the process and the detectability of liquids by RTR. Using ostensibly similar RTR equipment and trained operators, it was suggested that INEL uses a limit of .75 and RFP allows none (based on a discrimination threshold of "one teaspoon"). What is the real criteria, what is its basis, and what is the threshold of detection by the RTR? Why are adsorption materials not required to reduce free liquide to the minimum detectable? (Bishop)

m. What actions have been taken to identify the types and quantities of 40 CFR 261 Subpart C and D hazardous wastes that may be present in waste packages destined for WIPP? (Slosky)

n. How do the TRU waste generators and INEL determine compliance with the WAC for: corrosives, pyrophorics, explosives, and hazardous wastes (40 CFR 261 Subparts C and D)? (Slosky)

o. Does RFP and/or INEL have the laboratory equipment to determine the quantities of characteristic (40 CFR 261 Subpart C) and listed (40 CFR 261 Subpart C) hazardous wastes present in waste streams destined for WIPP? Does RFP or INEL participate in EPA's Contract Laboratory? (Slosky)

p. Have there ever been any TRU pyrophoric, explosive, or waste incompatibility problems at INEL or any of the TRU waste generating sites? (Slosky)

q. What methodology is being used at RFP for the Waste Characterization Study? (Slosky)

r. What methodology is used at RFP to "automatically designate" hazardous wastes? (Slosky)

s. Is it correct that the WAC do not require corrosives to be neutralized if a rigid liner is present? (Slosky)

t. Did the FY-83 through FY-85 TRU sampling program directly measure the radioactive and/or hazardous waste content of waste packages? Will the new sampling program make such measurements? (Slosky)

u. Are there radionuclides present in the TRU waste destined for WIPP that meet the RCRA definition of pyrophoric? (Slosky)

v. How has process knowledge been used to determine that explosive mixtures cannot occur in the TRU wastes? (Slosky)

w. Explain in more detail how the Passive-Active Neutron Assay system works. How does the system determine: fissile mass, total alpha, Pu-239 equivalent activity, and thermal power? (Slosky)

x. What are the capabilities and status of more accurate equipment to characterize the radioactive content of the TRU wastes? What modifications are being made to the SWEPP facility? (Slosky)

y. What activities are planned or underway to determine if some of the TRU waste in storage at INEL and RFP is actually LLW? Can these activities be accelerated? (Slosky)

z. What action is taken if a container is found to have more than 1000 curies of Pu-239 equivalent activity? (Slosky)

aa. Why are surface dose rate, surface contamination, and thermal power not rejection criteria? Is the PA based upon actual data on these parameters or the WAC for these parameters? (Slosky)

bb. Does WIPP/DOE-069 (page 42) correctly state that the surface contamination of the waste containers will result in the contamination of the WIPP waste handling building? (Slosky)

cc. What is the percentage contribution of the various processes (e.g., organic matter decay) to the total waste package gas generation? (Slosky) dd. What is the status of the PREP facility? Can its operation be accelerated? Is the plan to grout the entirety of the drums processed through PREP or only the fine particles? (Slosky)

ee. What are the types and quantities of TRU waste that do not meet the WIPP WAC? (Slosky)

ff. What are the RECAP/TROP programs? (Slosky)

6. THE ROCKY FLATS PLANT (RFP) WASTE CERTIFICATION VALIDATION PROGRAM

a. How are hazardous waste identifiers and data entered into the waste data base? (Kubo)

b. What role should representative sampling of the waste barrels using the RTR methodology as an independent check of the physical opening of drums? (Kubo)

c. With respect to Rocky Flats Plant waste certification validation, has the proposed validation plan been evaluated against having INEL evaluate RFP wastes through the SWEPP process as an alternative to determine if the RFP certification process was properly conducted? What is the expected cost, both in terms of dollars and radiation exposure, of the proposed validation plan? What would the incremental costs be of evaluation of the same wastes through the SWEPP process? (Bishop)

d. If the proposed RFP certification validation program is approved wouldn't it be a wise use of resources to collect data on hazardous material and organic constituents to provide further insight in support of the No Migration Variance Petition and the Performance Assessment, as well as to provide data to substantiate potential modifications to the TRUPACT II Certificate of Compliance to handle the TRU waste which cannot presently be carried in TRUPACT II? (Bishop)

e. Has an assessment been made of the costs to locate a waste repackaging facility at WIPP sop that only wastes emplaced during the "Test Phase" that might have to be repackaged (instead of merely being overpacked) could be done on-site? (Bishop)

f. Does DOE have a plan for addressing the storage of TRU and mixed wastes that are WAC certified but not TRUPACT II certified? (Squyres)

g. In light of the FBI investigation, will a validation program conducted at the RFP or by RFP personnel have credibility? (Slosky)

h. Will the radiological and hazardous chemical contents of waste packages be directly measured in the validation program? (Slosky)

7. PERFORMANCE ASSESSMENT AND OPERATIONS DEMONSTRATION

a. What is the basis for the decision on the amount of waste to be used in the Performance Assessment and Operations Demonstration? Was a cost-benefit evaluation, including personnel exposure, conducted as part of the evaluation? (Bishop)

b. What are the estimated costs of conducting (1) the Performance Assessment Test Programs, (2) the Operations Demonstration, and (3) complete retrieval of wastes emplaced under both programs? (Bishop)

c. How was the airborne release set point in the WIPP exhaust shaft established? What time delay will occur from a release in an alcove or room at a locally hazardous level before that release exceeds the set point in the exhaust shaft to trigger the ventilation shaft, assuming appropriate ventilation dilution factors? What local airborne monitoring system will be utilized when waste emplacement operations, either in the experimental rooms or as part of the Operations Demonstration, are underway? Will local alarms, both audible and visual, be provided and what personnel protective equipment will be provided to the site workers? (Bishop)

d. Please explain what DOE believes are the most severe adverse effects of the failure to begin the PA within the near term (3-5 months), the intermediate term (6-9 months) or the long term (beyond 9 months)? (Squyres)

e. The NAS review of the WI>PP Performance Assessment and Operations Demonstration draft plan (DOE/WIPP 89-011) states in the last paragraph of page 2 that it is unlikely that results of the experiments will be available for, or have any significant impact on the performance assessment. I'm told by EEG that results of the bin scale experiments will factor into the performance assessment but that alcove experiments may not. Is this the case? If so, what good will the alcove tests serve? Does DOE plan to delay the October 1992 decision data on performance assessment in order to factor in alcove test results that may come in after that date? (Bahr)

f. One concern about the operations demonstration program is if engineering modifications need to be made after emplacement of the waste, drums would have to be removed and perhaps be repackaged or in some other way modified. Should this be the case, where would the modifications be done? At the WIPP? At INEL? At generator sites? Who would make that decision? (Bahr)

g. Does DOE plan to enter into any agreements with New Mexico, Idaho, Colorado or any other state regarding the disposition of waste in the event it has to be retrieved from WIPP? (Bahr)

h. Who is responsible for the overall waste shipping plan, eg., which specific drums are shipped from where and when? Is there such a plan? How are the needs of performance assessment testing factored into this plan? The needs of the operations demonstration? (Bahr)

i. What information would be gained using "live" waste in the operations demonstration that cannot be gained by using "mock" waste for the operations demonstration? (Slosky)

## 8. TRANSPORTATION

a. Will a TRUPACK-II loaded with supercompacted CH drums (along with the tractor and trailer) exceed the 80,000 legal highway weight limit? (Slosky)

b. Will the total transportation unit for RH waste (cask, waste, tractor, and trailer) exceed the 80,000 legal highway weight limit? (Slosky)

c. Please provide a brief written comparison of the WIPP WAC to the NRC TRUPACT-II certification requirements. (Slosky)

d. What are the types and quantities of TRU and TRU-mixed wastes that cannot be shipped in TRUPACT-II? (Slosky)

## 9. MISCELLANEOUS

a. What is the capacity of WIPP with respect to: post-1970 TRU waste in storage at INEL and RFP, new TRU waste generation by the entire DOE complex, pre-1970 TRU waste buried at INEL, and anticipated TRU waste generation from DOE site cleanup actions? (Slosky)

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December 17, 1989

The Honorable Pete V. Domenici
United States Senate
Washington, D.C. 20510

My dear Senator Domenici:

Thank you for your letter of November 30, 1989. Enclosed are my responses to Senator Bingaman and Representative Schiff; they represent my personal views summarized as follows:

Performance Assessment Experiments: The bin experiments could be conducted at a generator and storage site; however, this would require the construction of a constant temperature facility to replicate the WIPP environment. This construction would add cost and delay the program. The bin experiments will require about 606 drum equivalents of waste initially. This quantity will increase to test various engineered alternatives designed to reduce gas generation. The alcove experiments must be accomplished underground at WIPP to provide the realistic environment necessary for the near full scale experiments based on various waste forms and alcove backfill designs. It is proposed to use six 25 by 100 foot alcoves. One alcove will not contain waste and provide baseline data, with the remaining five containing about 3850 drum volumes total.

Operational Demonstration Test: The Operational Demonstration will test the performance of the Transuranic (TRU) Waste Management System (WMS) against the design requirements. Components of the TRU WMS have been exercised already; others will be tested during the Performance Assessment Experiments (PAE) at WIPP. The full TRU WMS Operational Demonstration Test (ODT) should occur when the WIPP design (including the final waste form and WIPP emplacement procedures) is analytically finalized. Further, the Performance Assessment based on this design should reasonably show that compliance with final permitting requirements (including 40CFR191/268) will be achieved. The final design will not be decided until the PAEs data has been analyzed. At the earliest, the ODT should begin in two or three years if one of the last alcoves is filled to conform with the final WIPP design, with five or so years as a more realistic estimate. It is premature to suggest a quantity of wastes necessary to accomplish the ODT.

During the Performance Assessment Experiment phase of the WIPP Test Program the goal is to minimize the uncertainty that surrounds the long-term safety of the waste repository. It is important to view the PAE as maximizing knowledge for the ultimate safety of the repository. The more we understand about the mechanisms that affect long-term safety the less likely that a major disaster will occur in the distant future. The incremental near-term risk changes little if 5000 drums (about the scope of the current PAE) are used to conduct the experiment or 10,000, provided that the need for experimental data is valid. Once committed to conducting experiments in the WIPP with real waste, retrieval and operational safety are not much affected by such relatively small quantities of waste. In perspective, as of 1987 we have stored in near surface facilities 237,985 drum volumes of contact handled TRU waste at the ten generating and storage sites. WIPP is still in the research and development phase and not an operational facility. During this phase, the research and development program must demonstrate that WIPP is a safe TRU waste disposal facility. This goal must be kept separate from the demands to manage the defense nuclear weapons production program that generate the TRU/Mixed TRU waste. These are separate issues.

Deep geologic storage is the best option for safe disposal of nuclear waste. Unfortunately, the stability of the geologic media that provides the inherent safe disposal environment negates the possibility of an end-to-end proof test prior to committing to this course of action. Thus the ultimate assessment of the long-term safety of the WIPP will be based in large part on the ability to analyze, model, and predict the synergistic behavior of the waste and the encapsulating salt media based on valid experimental data. The performance assessment experiments should be designed to obtain these data as accurately and comprehensively as possible. If the bin experiments are conducted away from WIPP, the program will be delayed. WIPP is the only suitable site to conduct the alcove experiments. In summary, the performance assessment experiments must proceed as soon as legally and technically possible to obtain the scientific data necessary to design and model the long-term performance of the WIPP.

Finally, the WIPP Program suffers from an inconsistent set of RCRA and Radioactive Wastes Disposal regulations. The application of these disparate regulations has perversely influenced the evolution of WIPP. Wastes stored at WIPP should not be exempt from RCRA. Compliance has the salutary affect of minimizing wastes throughout the defense nuclear materials production program. However, the regulations governing WIPP must recognize that deep underground disposal of RCRA wastes differs substantially from near surface disposal methods of current industrial wastes. Further, Congress and the regulatory agencies might favorably consider supporting waste form modification facilities, such as incinerators, that if properly designed, licensed, and operated would add to the long term safety of waste disposal facilities such as WIPP and other land disposal options.

Similar inquires were received from Representatives Bill Richardson and Joe Skeen. I have responded to each.

I have enclosed a copy of my report as a panel member of the WIPP Blue Ribbon Panel. If you or the New Mexico delegation would like to discues my response to your questions or the content of my report, do contact me.

Sincerely,

Arthur S. Kubo

ASK:ask

Incl:as

## RESPONSE TO THE INQUIRY OF THE HONORABLE JEFF BINGAMAN

Question 1 - What is the rationale for conducting experiments in-situ rather than at existing waste generation and storage sites? "What is the minimum amount of waste that can be justified for in situ health and safety experiments?"

Response - As a member of the WIPP Blue Ribbon Panel, I have been chartered to review specific elements of Department of Energy plans for WIPP. As a reviewer, I have not proposed quantities of waste for emplacement in WIPP or any other of the experimental or test phases.

The performance assessment experimental program consists of three phases: Laboratory, bin and alcove experiments. Your question concerns the in-situ bin and alcove experiments; the laboratory experiments are not being conducted at WIPP.

The purpose of the bin experiments are to determine the gas generation rates and chemical reactions that occur when different transuranic (TRU) and TRU mixed with hazardous materials (Mixed-TRU) waste forms (old versus newly generated wastes, compacted versus uncompacted, solidified versus as-is, treated versus as-is, etc.) are placed in different repository environments (i.e., with and without brine, with and without gas getters, and other potential disposal environments).

Each bin experiment is currently designed to be the equivalent of six drums of waste placed in a single test bin (a large test box). There will be a bin experiment for most combinations of waste forms and repository environments. For some of the more likely disposal conditions there may be more than one bin experiment. The total amount of waste required for the bin experiments is a very small portion of the ultimate storage capacity of the WIPP. Current plans suggest 608 drum equivalents. This will increase to accommodate additional bin experiments to analyze various engineered alternatives to reduce the net gas generation. The exact quantity is not yet known because the full range of engineered alternatives that may control gas generation has not been determined at this date.

The bin experiments could be accomplished at one of the existing generation and storage sites. To accomplish the bin experiments at a site other than WIPP requires a constant temperature facility to replicate the in-situ environment. There is no such facility available at any of the generation and storage sites today. Design and construction of such a facility will cost more money and delay the program. Further, if the bin experiments are conducted at a site other than WIPP there is a remote risk that the bins could be contaminated by bacterial forms different than found at WIPP. This variation could confuse the results of the experiment. Bacterial decomposition of the organic wastes account for about 40 percent of the potential volume of gas generated.

The alcove experiments will place compacted and uncompacted TRU and Mixed-TRU waste packaged in drums in near full scale rooms mined in the bedded salt environment with and without backfill. The alcove experiments should be accomplished in-situ to properly replicate the ultimate disposal environment. The chemical and biological response of the waste in the salt formation is complex and synergistic. In-situ experiments are the only reasonable way to obtain useful and valid data. The alcove size for the experiment (25 by 100 feet) is comparable to the current WIPP room design. The selection of a similar test environment is specifically designed to facilitate interpretation of the data and provide confidence that the experiment represents an integrated assessment of a typical WIPP waste room. The total amount of waste necessary to accomplish the alcove experiment is again is small, consisting of 3850 drum volumes of waste. As the experimental phase progresses unexpected results will occur necessitating additional bin and possibly alcove tests. At this time it is extremely difficult to propose a minimum amount of waste that should be justified for in situ health and safety experiments; however, 10,000 drum equivalents might be taken as a reasonable upper bound, about twice the current proposed waste volume for in situ tests.

The performance assessment experiments are designed to provide the data necessary to increase the confidence that the behavior of the WIPP facility can be predicted over the times necessary to assess waste containment and lithostatic equilibrium to be reestablished, say 100 to 400 years after WIPP closure.

Question 2 - What is your recommendation regarding DOE's proposed operational demonstration experiments? What justification can you provide for waste emplacement during the operational demonstration experiments and what amount of waste emplacement do you propose. If you have not yet made a recommendation, when can we expect that recommendation?

Response - The purpose of the operational demonstration test is to exercise the TRU Waste Management System (WMS) to determine if the staff, procedures, equipment and materials operate in a safe manner and meet the systems design requirements. As is necessary in any complex system, subsystem testing must be accomplished first prior to accomplishing the full system test.

Various subsystems of the TRU WMS have be exercised already, e.g., the waste packaging and classification subsystem. Others such as the transportation and WIPP waste receipt subsystems will be tested during the shipment of waste to WIPP for the Performance Assessment experiments. Further, the entire TRU WMS except for the final waste form and emplacement configuration can be tested with dummy or actual waste packages today.

The planned start of the TRU WMS Operational Demonstration Test (ODT) should occur when the WIPP design (to include the final waste form and WIPP emplacement procedures) is analytically finalized. Further, the Performance Assessment based of this final design should reasonably show that compliance with the permitting requirements (including 40CFR191/286) will be achieved. Further, the full operational demonstration should not begin until there is a strong likelihood that the test will successful meet the technical goals and permitting requirements to allow full operations. This second requirement is important. A natural ODT scenario would begin at some minimal waste handling rate and escalate to the full design capacity, thereby facilitating a smooth transition from the ODT to full scale WIPP operations. If there is a substantial delay between the completion of the ODT and permitted WIPP operations, the training and final tuning of the staff and procedures will decay in direct proportion to the duration of the delay.

The quantity of waste necessary to accomplish the operational demonstration has not been determined yet, and it is premature to estimate the amount today. At the very earliest, the ODT is two to three years away, and more likely five.

# REPORT

# TO THE UNITED STATES SECRETARY OF ENERGY

# ON THE

# WASTE ISOLATION PILOT PLANT

BY

Leonard C. Slosky

Member

WASTE ISOLATION PILOT PLANT

BLUE RIBBON PANEL

October 23, 1989

# WASTE ISOLATION PILOT PLANT

# BLUE RIBBON PANEL

REPORT BY

LEONARD C. SLOSKY

October 23, 1989

## I. BACKGROUND

The Waste Isolation Pilot Plant (WIPP), as established by Public Law 96-164, is being developed by the United States Department of Energy (DOE) to demonstrate the safe disposal of transuranic (TRU) waste from the nation's nuclear weapons program.

WIPP is a mined repository located 2,150 feet below the surface of southeastern New Mexico. The repository is within a 2,000 foot thick formation of 225 million year old bedded salt. WIPP is designed to dispose of nearly six million cubic feet of TRU wastes produced between 1970 and the year 2013. It is the only TRU waste disposal facility under development in the United States.

## II. INTRODUCTION

The WIPP Blue Ribbon Panel (BRP) was established by the Secretary of the United States Department of Energy (DOE) on August 31, 1989. Each of the five Panel members was charged to independently report on the following issues related to WIPP:

- The concept and timing of the draft plan for the WIPP test phase: the performance assessment (including the waste experiments) and the operations demonstration.
- Whether the operations demonstration should be conducted at the same time as the waste experiments and the performance assessment.
- The adequacy of plans to ensure that the TRU wastes generated by the Rocky Flats Plant (RFP) meet the waste acceptance criteria (WAC) for the WIPP.

The short amount of time allotted to the BRP, together with the complexity and extensive history of WIPP project, presented the BRP with a formidable task. Because of this, this report should be considered preliminary in nature. It also should be noted that the BRP was not charged and has not attempted to review all of the important issues concerning WIPP. In particular, the Panel has not addressed the operational readiness of WIPP.

## III. BLUE RIBBON PANEL ASSESSMENT METHODOLOGY

The following methodology has been used by the BRP:

- During September 11-14, 1989, the BRP toured the WIPP, portions of the Idaho National Engineering Laboratory (INEL), and portions of the RFP. During this period the BRP was briefed by numerous DOE officials and contractors; Dr. Peter B. Myers, Staff Director of the National Academy of Sciences/National Research Council Board on Radioactive Waste Management; Mr. Robert H. Neill, Director and Dr. Lokesh Chaturvedi, Deputy Director and Engineering Geologist of the Environmental Evaluation Group, New Mexico. Most of the people who briefed the Panel also provided written materials.

- On September 25-26, 1989, the BRP convened a follow-up meeting in Denver, Colorado. At this meeting, a select group of DOE officials, DOE contractors, and a representative of the United States Environmental Protection Agency (EPA) were requested to respond to ten pages of questions prepared by the BRP.

- The BRP has been provided an extensive number of DOE documents, including *Draft Plan For The Waste Isolation Pilot Plant Test Phase: Performance Assessment and Operations Demonstration*, April 1989 and June 1989 Addendum. DOE/WIPP 89-011; *TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, January 1989. WIPP/DOE-069, Revision 3.

- The BRP and individual Panel members have requested and been provided additional documents from DOE. Individual Panel members have held discussions with a broad range of individuals knowledgeable about WIPP.

Throughout the process, officials from DOE have been quite informative, candid, and helpful to the BRP.

## IV. EXECUTIVE SUMMARY

Following is a summary of the principal observations and recommendations.

1. The Waste Isolation Pilot Plant (WIPP) program is of major national importance even beyond the transuranic (TRU) waste management system. The success or failure of WIPP will have extensive impacts on the United States Department of Energy (DOE) as well as on civilian radioactive waste management programs.

2. DOE should implement an integrated management system for TRU waste and the WIPP program.

3. A considerable amount of work must be completed before WIPP can receive waste for the test phase. A number of potential legal challenges could impede the beginning of the test phase.

4. Rather than only including technical issues, the WIPP waste retrieval plan should address the regulatory and institutional actions required to store the waste if retrieval from WIPP becomes necessary.

5. Significant technical questions exist regarding the ability of WIPP to comply with the applicable regulatory requirements: the environmental radiation protection standards, the no migration exemption from the land disposal restrictions, and the hazardous waste facility standards. Despite the unresolved technical issues, bedded salt continues to offer outstanding qualities for the long-term isolation of TRU waste.

6. DOE should develop and publish within the next six months an integrated and coherent set of documents on the WIPP program:

First, a systematic assessment of the current understanding of the long-term performance of the WIPP repository, as recommended by the National Research Council. This document should include a sensitivity analysis and should clearly indicate existing uncertainties and the data needed to determine if WIPP complies with regulatory requirements.

Second, a generalized description of the laboratory, bin, and alcove experiments. This document should clearly indicate how the experiments address the data needs identified in the first document.

Third, a detailed technical description of the laboratory, bin, and alcove experiments.

7. Essential data from the bin and alcove experiments (particularly concerning gas generation) may not be available as soon as DOE expects. It is also very possible that the results from the planned tests will raise new issues that necessitate additional experiments. Thus, it may take longer than the three to five years DOE projects to determine WIPP's regulatory compliance.

8. It is imperative that the test phase not only obtain data on important technical issues such as gas generation, but also test solutions to these problems. Therefore, the alcove and particularly the bin tests should be expanded to include a broad range of: nonmetallic containers, treated waste forms, and additives to prevent gas build up.

9. Increased attention should be directed to evaluating potential waste treatment technologies. In contrast to other parameters affecting the performance of the repository (e.g., hydrogeologic processes), the waste form is one of the most controllable variables. Since about 90 percent of the total waste volume to be emplaced at WIPP is yet to be generated or will likely require repackaging, the opportunity exists to develop a more stable waste form that would moot a number of the unresolved technical issues and would dramatically improve the ability of WIPP to meet regulatory standards.

10. The bin experiments should begin as soon as possible. If WIPP cannot receive waste for experimental purposes by (or shortly after) mid-1990, the bin tests should be promptly initiated at another location.

11. The alcove tests are an important part of the WIPP test phase because they integrate important repository conditions that laboratory and bin tests cannot fully represent. However, current scheduling calls for the "final" performance assessment to be conducted before the majority of the alcove test results are likely to be available.

12. In total, about 5,900 drum-equivalents of waste are justified for the currently planned test program. This is equal to about 0.8 percent of total WIPP capacity. With the recommended expansion of the test program, about 8,800 drum-equivalents of waste (equal to about 1.2 percent of WIPP capacity) may be needed.

13. An operations demonstration is an important element in ensuring the operational readiness of a "production" facility. However, given the current degree of uncertainty regarding the ability of WIPP to meet regulatory requirements, it is not prudent to transport large quantities of waste (i.e., 2.5 percent of total capacity) to WIPP. In addition, since WIPP design and operational configurations are uncertain, an operations demonstration in the near-term would not be representative of actual repository conditions. If DOE wants to obtain more experience in the operation of the WIPP system at full-capacity, drums and standard waste boxes containing nonradioactive materials could be used. The Operations Demonstration should be separated from the Test Plan in order to avoid confusion.

14. It is not clear that a comprehensive assessment has been made of the applicability of federal and state hazardous waste regulations to the WIPP program. Considerably more attention to hazardous waste compliance issues is needed to prevent potentially serious delays in WIPP. DOE should aggressively work to resolve the applicability of the Safe Drinking Water Act's underground injection control requirements to WIPP.

15. DOE should expeditiously prepare a comprehensive hazardous waste compliance strategy. DOE should work closely with the State of New Mexico on the promulgation of mixed waste regulations and in the preparation of permit applications.

16. DOE should develop a comprehensive plan to characterize the hazardous (nonradioactive) components of TRU-mixed wastes being generated and in storage. The characterization plan must include substantial laboratory waste analyses.

17. DOE should take advantage of the opportunity to obtain hazardous waste characterization information when wastes are being processed for other purposes. This includes laboratory analyses when waste packages are opened and physically inspected for compliance with the waste acceptance criteria (WAC); head space gas analysis when waste packages are vented; and analysis of liquids resulting from the supercompaction of wastes.

18. Waste packages in the TRU waste inventory that are actually low-level wastes should be removed from the TRU waste inventory.

19. DOE needs to ensure that the databases being used for the performance assessment and other regulatory purposes are consistent with the WAC. It is not clear how the performance assessment will take into consideration the authority of the Waste Acceptance Criteria Certification Committee (WACCC) to exempt wastes from the WAC in the future.

20. DOE should integrate the WAC, the TRUPACT-II shipping requirements, and future hazardous waste restrictions into comprehensive criteria for certifying wastes for WIPP. Waste containers that are aspirated in non-humidity controlled environments should be subject to real-time radiography immediately prior to shipment to ensure that the criterion for liquids is not exceeded.

21. DOE should actively encourage and facilitate observers from the New Mexico Environmental Improvement Division, the Colorado Department of Health, the State of Idaho, and the Environmental Evaluation Group to accompany the DOE waste certification auditors.

22. Unannounced audits at each TRU waste generator facility should be conducted at least annually. The audits should include radiological assaying and real-time radiographic examination of a sufficient number of waste packages to ensure at least a 95 percent confidence level that wastes are being properly certified.

23. State representatives should be encouraged to observe the Rocky Flats waste recertification audits and inspections. The Rocky Flats waste recertification program should include the selection of waste packages by the audit team/state observers for radiological assaying and real-time radiographic examination under the audit team's review.

## V. OBSERVATIONS, RECOMMENDATIONS, AND DISCUSSION

### A. MANAGEMENT OF THE WIPP PROGRAM

Observation A.1:

The WIPP program is of major national importance even beyond the defense TRU waste management system. The success or failure of the WIPP program will have extensive impacts on the entire defense program of DOE, as well as on civilian radioactive waste management programs, both inside and outside of DOE. WIPP is an important test case for how the "DOE Culture" can adapt to the new environment of outside regulation and public scrutiny.

Observation A.2:

The DOE TRU waste management system is sufficiently complex as to necessitate a sophisticated systems management approach. Currently it appears that an adequate systems management approach is lacking.

Discussion:

It is acknowledged that integrating ten TRU waste generators (producing many different waste streams) with the first deep geological repository in the United States, while the regulatory environment is in flux, is far from a trivial matter. However, much greater emphasis on systems integration is needed for the DOE TRU waste management system to function effectively. The problem is not that individual elements of the program are inadequately managed. Many of the managers who briefed the BRP appeared to be doing an outstanding job with respect to their particular area of responsibility. Rather, the shortcoming is in the effective integration of the many elements comprising the DOE TRU waste management system.

Following are a few examples illustrating TRU waste management elements that do not appear to be adequately integrated:

- o There does not appear to be a direct linkage between TRU waste generators implementing new waste treatment technologies and the performance of the WIPP site. There does not appear to be a central management focus for assessing question such as: What impact does the supercompaction of waste from the RFP have on the performance of WIPP? Does supercompaction pose repository criticality concerns? How are plans for changes in waste forms communicated to the WIPP performance assessment team? Who has the authority and the responsibility to determine if a new waste form will be acceptable at WIPP?

- o The Waste Acceptance Criteria Certification Committee (WACCC) has the authority to approve wastes for disposal at WIPP that do not meet the WAC. How is this accounted for in the WIPP performance assessment? How can it be accounted for in the performance assessment when the WACCC can exempt waste from the WAC years after the performance assessment is completed?

Recommendation A.1:

DOE should implement a comprehensive, integrated management system for TRU waste generation, treatment, transportation, storage, and disposal. The management system should encompass all DOE TRU waste generators and should include planning, research, and operational aspects of TRU waste management.

## B. "DOE CULTURE"

Observation B.1

A number of the DOE managers who briefed the BRP exhibited a frustrated attitude, implying that WIPP is obviously an exemplary facility; why don't people just let us use it?

Discussion:

At a time when the preliminary performance assessments conducted by DOE indicate that WIPP does not comply with the Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes 40 CFR Part 191, Subpart B (EPA Standard) for human intrusion scenarios, such an attitude can easily be perceived as arrogant, sloppy, and unconcerned about safety and the environment. Such perceptions do not facilitate rational issue resolution.

Recommendation B.1:

DOE managers should recognize and exhibit in their attitudes that WIPP is being developed in a new era of external regulation. The mission of DOE is to carefully, scientifically, and systematically assess whether or not WIPP complies with the EPA Standard and other regulatory requirements. This means that all of the facts (and uncertainties), whether favorable or unfavorable to WIPP, need to be clearly presented and publicly debated.

## C. PREREQUISITES TO THE RECEIPT OF WASTE AT WIPP FOR EXPERIMENTAL PURPOSES

Observation C.1:

A number of actions must be completed before waste can be received at WIPP, even for experimental purposes. The important milestones include, but may not be limited to:

- Obtaining a Resource Conservation and Recovery Act (RCRA) Part A Interim Status Permit by filing a complete Part A application pursuant to 40 CFR Part 270. Before this can occur, the State of

New Mexico must receive authorization from EPA to regulate mixed wastes.

- Receiving approval of the No Migration Petition from EPA to exempt WIPP from the Land Disposal Restrictions pursuant to 40 CFR Part 268.6.
- Demonstrating compliance with the EPA regulations on Environmental Standards for Management and Storage of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste, 40 CFR Part 191, Subpart A.
- Completing the Final Safety Analysis Report (FSAR).
- Completing the Operational Readiness Review (ORR).
- Complying with the Agreement for Consultation and Cooperation (C&C) between the United States Department of Energy and the State of New Mexico.
- Obtaining Land Withdrawal approval.
- Publishing the Final Supplement Environmental Impact Statement (FSEIS) on WIPP and issuing the Record of Decision (ROD).
- Issuing the final WIPP waste retrieval plan. Successfully completing the bin and alcove retrieval tests.
- Completing the Performance Assessment (PA) Plan.

Observation C.2:

Although the Secretary's Draft Decision Plan on WIPP (October 1989) identifies these actions, this list is provided to emphasize the considerable amount of work that must be completed for WIPP to receive waste for experiments, and to illustrate the numerous opportunities for legal challenges with which the WIPP program may have to contend.

Observation C.3:

DOE is currently developing a WIPP waste retrieval plan to address the technical aspects of waste retrieval, if WIPP is found unsuitable as a permanent repository.

Recommendation C.1:

The WIPP waste retrieval plan should address the regulatory and institutional requirements for implementing each waste retrieval alternative. Without consideration of such requirements, the institutional feasibility of the plan may be nil.

Observation C.4:

While many of the elements of the test program have been provided in various DOE documents, DOE has not adequately articulated the need for and design of the test program in an integrated manner.

Recommendation C.2:

DOE should develop and publish within the next six months a hierarchial, integrated, and coherent set of documents on the WIPP test phase. This set of documents should include:

- o Preliminary WIPP Performance Assessment 1989 -A systematic assessment of the current understanding of the long-term performance of the WIPP repository, as recommended by the National Research Council. This document should include analyses of a range of scenarios (including human intrusion) and a comprehensive sensitivity analysis. The report should elucidate the critical issues, uncertainties in data and models, and the parameters for which additional data are needed.
- o Conceptual WIPP Test Phase Plan--A generalized description of the laboratory, bin-scale, and alcove-scale experiments already underway and planned for the test phase. This document should clearly indicate how the on-going and planned experiments address the data needs identified in the Preliminary Performance Assessment 1989, above. This document should replace the *Draft Plan For The Waste Isolation Pilot Plant Test Phase: Performance Assessment and Operations Demonstration.*
- o WIPP Experimental Design--A detailed technical description of the laboratory, bin-scale, and alcove-scale experiments to be conducted during the test phase. This document should be a more detailed technical version of the Conceptual WIPP Test Phase Plan, above. As with the Conceptual Plan, this document should indicate how the experiments will provide the data needs identified in the Preliminary Performance Assessment 1989.

## D. CONCEPT AND TIMING OF THE WIPP TEST PHASE AND OPERATIONS DEMONSTRATION

### 1. Test Phase

Observation 1.D.1:

Significant technical questions regarding the ability of WIPP to meet the EPA Standard and other regulatory requirements remain to be resolved. A carefully planned, integrated, and implemented suite of tests--laboratory, bin-scale, and alcove-scale--is needed to provide additional data for the performance assessment (to determine compliance with the EPA Standard), the no migration petition, and the RCRA Part B permit application. Despite the substantial unresolved technical issues, bedded salt continues to offer outstanding qualities for the long-term isolation of TRU waste.

Observation I.D.2:

DOE plans call for a hold point after the first three years of the test phase to analyze the results of the performance assessment up to that point. If this review concludes that there is reasonable confidence that WIPP will meet the EPA Standard, then a decision will be made on the need for and the design of the second portion of the test phase. This approach has great merit. Because of the issues discussed below, it is likely that the second portion of the test phase will be required.

Observation I.D.3:

Because of the complexity and interaction of the technical issues that must be resolved, it may take longer than five years for adequate test results to be available to determine compliance with the EPA Standard. It is also very possible that either the laboratory, bin-scale, or alcove-scale tests will raise new issues requiring additional experiments.

Observation I.D.4:

One of the key questions the test phase needs to resolve is the net rate of gas generation/diffusion which results from at least five processes: chemical corrosion of the waste containers and metal within the wastes; biological decomposition of the organic matter in the wastes; radiolytic decomposition of waste materials; inflow of naturally occurring gas in the salt; and the diffusion of gas into the salt formation.

Because of the incomplete understanding of these processes and potential interactions among the processes, both the bin-scale and the alcove-scale tests may need to be conducted for a longer period of time than is anticipated in the test plan in order to obtain adequate data. This in turn means that the data needed for the "final" performance assessment may not be available in time to conduct the performance assessment on the current schedule.

Recommendation I.D.1:

The bin-scale and the alcove-scale tests should be continued at least until the decision is made regarding the suitability of WIPP as a permanent disposal site, and probably as long as WIPP is operational (25 or more years).

Observation I.D.5:

It is very important for the test phase not only to gather data on important technical issues such as gas generation, but also to test solutions to the potential technical problems. This means that the scope of the test phase experiments may need to be expanded. For example, it may be advisable to include in the bin-scale tests nonmetallic containers (e.g. high integrity containers) and several different treated waste forms to address the gas generation issue. This means that an increased number of bins and a corresponding larger quantity of waste may be needed for the test phase. If such an approach is not taken, it is possible that following completion of the currently planned test phase, a subsequent test phase will be needed.

Recommendation I.D.2:

The test phase and the bin-scale experiments in particular should be expanded to include a broad range of potential solutions to the gas generation problem such as: gas getters, preventers, and recombiners; several treated waste forms; nonmetallic containers; etc.

Observation I.D.6:

Current plans call for the TRU waste to be emplaced in the WIPP repository in an essentially untreated form. In contrast with the other parameters affecting the performance of the repository (e.g., hydrogeologic processes), the waste form is one of the most controllable variables. Since about 90 percent of the total volume of contact-handled waste to be emplaced at WIPP is yet to be generated or is expected to require repackaging, the opportunity exists to develop a more stable waste form that would moot a number of the existing technical issues and would dramatically improve the ability of WIPP to meet the EPA Standard.

Recommendation I.D.3:

The test phase and the bin-scale experiments in particular should be expanded to include a broad range of potential treated waste forms, such as drum grouting, shredded waste, thermal treatments, etc.

Recommendation I.D.4:

On a periodic basis, DOE should assess the trade-offs between continuing to attempt to demonstrate compliance with the EPA Standard and other regulatory requirements using existing TRU waste forms versus committing to waste treatment(s) that would simplify and resolve many of the regulatory compliance issues.

Observation I.D.7:

The inclusion of the Operations Demonstration (which is perceived by some as a pretext to ship large quantities of waste to WIPP before compliance with the EPA Standard has been demonstrated) has confused the purpose of the test phase and has undermined its credibility.

**Bin-Scale Tests**

Description:

The bin-scale tests are divided into three phases as described below.

> Phase 1: Generally as-received waste, no backfill. Will utilize 40 bins containing about 210 drum-equivalents of uncompacted waste. In place 7/90.
>
> Phase 2: As-received and compacted waste, backfill in drums. Will utilize 76 bins containing about 390 drum-equivalents of uncompacted waste. In place 4/91.
>
> Phase 3: Largely undefined, but intended to incorporate contingencies and engineering modifications to waste and/or backfill. In place 12/91.

Phases 1 and 2 will require about 600 total drum-equivalents of waste. This is equal to about 0.08 percent of the total capacity of WIPP (for contact-handled waste).

Observation I.D.8:

The bin-scale tests are an essential portion of the test program. The results of the bin-scale tests may be needed in order to obtain approval by EPA of the no migration petition. It is possible that regulatory or operational issues could delay the receipt of waste at WIPP for experimental purposes significantly beyond mid-1990.

Recommendation I.D.5:

The bin-scale tests should begin as soon as possible. If WIPP cannot receive waste for experimental purposes by (or shortly after) mid-1990, the bin-scale tests should be promptly initiated at another location permitted for such purposes.

Observation I.D.9:

Two important pieces of information are needed for the bin-scale tests that do not currently appear to be available: (1) chemical characterization of the Salado brine; and (2) characterization of the TRU waste inventory for hazardous waste components.

Discussion:

If the bin-scale tests are initiated and it is then determined that the Salado brine (which will interact with the waste in the repository) is significantly different in chemical composition than the brine used in the bin-scale tests, the bin-scale tests may not be representative of repository conditions and may need to be repeated. Likewise if the hazardous waste components of the waste used for the bin-scale tests are not known or if they are found to be significantly different from the overall TRU waste inventory, the bin-scale tests will not have addressed important issues concerning repository performance and regulatory compliance.

Recommendation I.D.6:

The bin-scale tests should preferably use actual Salado brine or secondarily utilize simulated Salado brine developed after the Salado brine is adequately characterized. The wastes to be used for the bin-scale tests should be characterized for hazardous waste components. Further work is needed to determine how the hazardous waste characterization of TRU-mixed wastes can best be accomplished.

**Alcove-Scale Tests**

Description:

The alcove-scale tests consist of two phases as follows.

Phase 1: Intended to simulate the operational phase of WIPP; consists of two alcoves:

Alcove 1--empty (no waste) gas baseline-reference. Utilizes zero drums. In place 7/90.

Alcove 2--as received waste, no backfill. Utilizes 1,050 drum-equivalents. In place 7/90.

Phase 2: Intended to simulate the post-operational phase of WIPP; consists of four alcoves:

Alcove 3--specially prepared non-compacted waste with brine and backfill within drums. Will utilize 1,050 drum-equivalents. In place 5/91.

Alcove 4--specially prepared compacted waste with brine and backfill within drums. Will utilize 1,050 drum-equivalents. (Due to compaction, 350 drums will be shipped to WIPP.) In place 11/91.

Alcove 5--specially prepared, non-compacted waste with brine and backfill within drums. Also with external backfill in alcove. Will utilize 1,050 drum-equivalents. In place 11/91.

Alcove 6--specially prepared compacted waste with brine and backfill within drums. Also with external backfill in alcove. Will utilize 1,050 drum-equivalents. (Due to compaction, 350 drums will be shipped to WIPP.) In place 4/92.

In total, the alcove-scale test phases 1 and 2 will utilize about 5,250 drum-equivalents of waste. This is equal to about 0.7 percent of the total capacity of WIPP (for contact-handled waste).

Observation I.D.10:

The alcove-scale tests are an important part of the WIPP test phase. The alcove-scale tests are needed to investigate important repository conditions that laboratory and bin-scale tests cannot fully represent. Alcove-scale tests have the advantage of being able to more realistically represent:

- Potentially synergistic effects of the repository itself (i.e., gases and brines released from the host rock, mine biochemistry, etc.) on the rates and modes of waste degradation and gas generation.
- The full-scale size of the repository.
- The radiological and hazardous waste source terms included in the large number of TRU waste types intended for disposal at WIPP.

Observation I.D.11:

While the experiments are planned to be conducted for a relatively short period of time (five years), the experiments are intended to provide information to allow prediction of repository behavior over the long-term (1,000 to 10,000 or even 100,000 years). The geohydrologic complexity of the WIPP repository makes the collection of meaningful and reliable experimental results extremely difficult. For example, will the disturbed rock zone interfere with measurements of the long-term salt permeability, as well as brine and gas inflow into the waste rooms? Will the disturbed rock zone have to be instrumented in order to determine its impact? Can the disturbed rock zone be instrumented without changing its properties.

Recommendation I.D.7:

Since alcove 1 (gas baseline-reference) does not require any waste it should be initiated as soon as possible, preferably before 7/90.

## Timing of the Test Phase

Following is a listing of key events in the WIPP test program and their scheduling, as presently understood or inferred from a number of DOE documents and presentations to the BRP. This timeline assumes that waste receipts at WIPP begin in July 1990. This listing is not intended to indicate all of the important (or even critical-path milestones); it has been prepared to illustrate apparent problems in the sequencing of test phase activities. Therefore, what is important are not the specific dates but the sequence of events. (The current DOE schedule for the test phase is unclear; written materials presented to the BRP within the last several weeks have different dates for a number of these activities.)

| Activity | Date |
|---|---|
| Phase 1 bin experiments initiated | 7/90 |
| Alcove 1 experiment initiated | 7/90 |
| Alcove 2 experiment initiated | 7/90 |
| Engineering enhancements report, preliminary | 8/90 |
| Backfill selection complete | 10/90 |
| Engineering enhancements report, final | 12/90 |
| Large-scale room seal experiments complete | 1/91 |
| Phase 2 bin experiments initiated | 1/91 |
| Alcove 3 experiment initiated | 2/91 |
| Phase 1 bin experiments initial results | 3/91 |
| Alcove 4 experiment initiated | 7/91 |
| Decision on engineering enhancements | 9/91 |
| Phase 2 bin experiments initial results | 10/91 |
| Phase 3 bin experiments (with engineering fixes) initiated | 12/91 |
| Alcove 5 experiment initiated | 1/92 |
| Alcove 1 reliable results available | 6/92 |
| Alcove 2 reliable results available | 6/92 |
| Alcove 6 experiment initiated | 7/92 |
| Phase 3 bin experiments initial results | 9/92 |
| Latest date that data from the experiments can be used in "final" performance assessment | 9/92 |
| Alcove 3 reliable results available | 5/93 |
| Hold point for review of performance assessment | 7/93 |

| | |
|---|---|
| Draft EPA compliance report released | 9/93 |
| Alcove 4 reliable results available | 11/93 |
| Alcove 5 reliable results available | 1/94 |
| Alcove 6 reliable results available | 9/94 |
| Final EPA compliance report released/<br>Decision on WIPP as a disposal facility | 9/94 |

Observation I.D.12:

The scheduling of the test phase assumes that useful data will be rapidly available from the experiments. It is not likely that obtaining adequate data on gas generation will require significantly longer time periods.

Observation I.D.13:

The scheduling of the test phase assumes that enough is known about the performance of TRU waste in salt to concurrently conduct the three scales of testing: laboratory, bin, and alcove. Given the current range of uncertainties and the complexity of the interactions, this assumption has a significant probability of turning out to be incorrect.

Observation I.D.14:

Results from the engineering enhancements study will not be available until relatively late in the test phase. By the time decisions are made on engineering enhancements (9/92), all of the phase 1 and phase 2 bin tests will already be underway, as will alcove tests 1, 2, 3, and 4. This means only alcoves 5 and 6, and a third phase of bin-scale tests will be able to incorporate engineering enhancements that may be necessary for WIPP to comply with the EPA Standard.

Observation I.D.15:

According to the existing schedule, the latest date that data can be input to the "final" performance assessment is 9/92. As of this date, reliable results from alcove tests 3, 4, 5, and 6 are unlikely to be available. In addition, if a third phase of bin-scale tests are needed, data from such tests are also unlikely to be available by 9/92. Thus, a significant portion of the data to be produced in the test phase will not be available in time to be used in the "final" performance assessment.

Recommendation I.D.8:

Aside from delaying the "final" performance assessment, which may turn out to be inevitable, the primary action to increase the utility of the test phase is to increase the range of experiments conducted at the alcove-scale and particularly at the bin-scale.

Observation 1.D.16:

Alcoves 1 and 2 are scheduled to be sealed five months before the large-scale room seal experiments are scheduled to be complete. This is of concern because maintaining an airtight seal (to maintain anoxic conditions as will exist in the repository) is essential to the alcove tests.

Observation 1.D.17:

The alcove 3 experiment is scheduled to begin before significant data from the bin-scale experiments is likely to be available. This means that the backfill to be used in the drums in alcove 3 will be chosen before it is known if that backfill was effective in the bin-scale tests.

### 2. Operations Demonstration

Description:

The Operations Demonstration plan calls for the shipment of a large quantity (approximately 18,900 drums, which is equal to about 2.5 percent of the capacity of WIPP for contact-handled waste) of waste to WIPP essentially concurrently with the conduct of the bin-scale and alcove-scale experiments. This activity is intended to demonstrate the operational capability of the entire WIPP-related TRU waste management system including: generators' waste certification and TRUPACT-II loading, the transportation system, and waste receipt and emplacement at WIPP. The operations demonstration will not provide data useful in determining compliance with the EPA Standard.

Observation 2.D.1:

An operations demonstration is an important element in ensuring the operational readiness of a "production" facility. However, given the current degree of uncertainty regarding the ability of WIPP to meet the EPA Standard, it is not prudent to transport large quantities of waste to WIPP in the next several years. If WIPP is determined not to comply with the EPA Standard, all waste emplaced at WIPP would have to be removed and shipped elsewhere for storage, treatment, and/or disposal.

Observation 2.D.2:

Until a detailed study of engineering enhancements has been completed and reviewed, at least interim results are available from the bin-scale and alcove-scale experiments, and compliance with the EPA Standard has been demonstrated through performance assessment, the specific design and operational configuration of the WIPP underground will not be known. Thus, an operations demonstration prior to this point cannot demonstrate actual operational conditions. Therefore, a near-term operations demonstration will have limited value.

Observation 2.D.3:

The preparation of TRUPACT-II shipments by the generators, shipments along the transport routes, and emplacement of waste for the bin-scale and the alcove-scale experiments will provide significant operational experience. Assuming that 4,450 drums will be shipped to WIPP for waste experiments, about 106 TRUPACT-II shipments will be needed. If DOE believes that it is necessary, during the next few years, to obtain more experience or to demonstrate the operation of the WIPP system at full-capacity, nonradioactive simulated drums and standard waste boxes should be used.

Observation 2.D.4

The results of the test phase may necessitate the redesign of the waste rooms (e.g., smaller rooms to reduce the source term available for human intrusion) or treatment of the waste. If an operations demonstration is conducted prior to the resolution of such issues, it is possible that all of the waste emplaced for demonstration purposes would have to be moved to smaller rooms, removed for treatment at WIPP, or shipped elsewhere for treatment. This would result in significant additional radiation exposures to personnel, expense, and work effort.

Observation 2.D.5:

Plans for the Operations Demonstration appear to have been driven more by the need for additional TRU waste management capacity to serve defense program operational requirements than by the need for technical information related to WIPP. Regardless of the technical safety of storing wastes in WIPP, if DOE stores more waste in WIPP than is needed for waste performance experiments, DOE will be perceived as moving too fast, or of putting operational needs ahead of environmental and safety concerns.

Recommendation 2.D.1:

An operations demonstration with radioactive waste should be delayed until WIPP has been determined to comply with the EPA Standard and until the design and operational configuration of WIPP is resolved.

Recommendation 2.D.2:

The Operations Demonstration Plan should be separated from the Test Plan in order to avoid confusion. While the Operations Demonstration Plan and the Test Plan should be separated, it is important to recognize and maintain the interrelationships between these two programs.

## E. REPROMULGATION OF THE ENVIRONMENTAL RADIATION PROTECTION STANDARD

Observation E.1:

It is not clear that the repromulgated EPA Standard (Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes 40 CFR Part 191, Subpart B) will satisfy the objections contained in the 1987 decision by the United States Court of Appeals For the First Circuit, or that the repromulgated standard will be able to withstand legal challenges on other grounds.

Although DOE is following the development of the new standard by EPA, until the standard is actually promulgated and any legal challenges resolved, it is not known what performance standard WIPP will be required to meet as a permanent disposal facility. This "moving target" subjects WIPP to a considerable amount of regulatory uncertainty.

Observation E.2:

One of the reasons the Court remanded the Standard to EPA in 1987 was that the Court believed WIPP to be an underground injection well and that the EPA Standard was less stringent than, and therefore inconsistent with the standard under the Safe Drinking Water Act to which underground injection wells are regulated.

Recommendation E.1:

DOE should explore options for resolving this issue, including determining if an underground injection control permit is needed for WIPP and statutorily clarifying the applicability of the Safe Drinking Water Act to WIPP.

## F. COMPLIANCE WITH FEDERAL AND STATE HAZARDOUS WASTE REGULATIONS

Observation F.1:

It is not clear that a comprehensive and systematic assessment of the applicability of federal and state hazardous waste regulations to the WIPP program has been conducted. Without such planning, hazardous waste requirements have the potential to stall the WIPP program at numerous points.

It is not clear that all of the plans for WIPP are in compliance with applicable hazardous waste regulations. For example, the operational procedures for WIPP clearly state that waste containers will not be opened at WIPP. However, the federal regulations specifying Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264) appear to require that waste analyses be conducted at the disposal facility.

Discussion:

Planning by DOE is needed to minimize the chance that federal or State of New Mexico hazardous waste regulations do not catch the WIPP program by surprise. For example, there could be significant uncertainty in the RCRA Part B permitting process for WIPP. It is not uncommon for the RCRA Part B permitting process for land disposal facilities to take three or more years. Nationally, very few permits have been issued under the "Miscellaneous Units" provision to which WIPP is subject (40 CFR 264.600). No RCRA permit has ever been issued for a deep geologic repository.

Recommendation F.1:

DOE should promptly conduct a comprehensive and systematic assessment of the WIPP program's compliance with federal and State of New Mexico hazardous waste regulations. The assessment should identify each of the specific provisions of federal and state regulations that apply to the WIPP program. Following this assessment, a compliance strategy should be developed for each applicable provision. DOE should work closely with the State of New Mexico on the promulgation of mixed waste regulations and the preparation of hazardous waste permit applications.

Observation F.2:

Inadequate analytic data are available on the types and quantities of hazardous wastes in the TRU wastes intended to be disposed in WIPP.

Discussion:

Almost all existing waste characterization information is based on process knowledge. Process knowledge may provide a reasonably accurate characterization of hazardous wastes for the newly generated TRU-mixed waste. However, process knowledge may not provide sufficiently accurate characterizations for wastes generated nearly 20 years ago. Hazardous waste characterization data are needed for a number of purposes including: the performance assessment, the no migration petition, and the RCRA Part B permit application. Hazardous waste characterization data are also needed to comply with federal or state hazardous waste regulations at every site at which TRU-mixed wastes are generated and/or stored. Without actual measurements of the hazardous components in both old and newly generated TRU-mixed wastes, the WIPP program will continue to suffer a credibility problem and is also likely to encounter regulatory challenges.

It is recognized that conducting hazardous waste characterizations on TRU-mixed wastes presents formidable technical and personnel exposure problems that need to be addressed.

Recommendation F.2:

DOE should promptly develop a comprehensive, Department-wide plan to characterize the hazardous (nonradioactive) components of TRU-mixed waste being generated and in storage.

When TRU wastes are being examined for other purposes, DOE should take advantage of the opportunity to obtain information on the hazardous components in the wastes. Several such opportunities are:

- o When waste packages are opened and physically inspected for compliance with the WAC.
- o When waste packages are vented.
- o When wastes are supercompacted.

Discussion:

Since all waste packages are required to be vented prior to shipment to WIPP (in TRUPACT-II), the opportunity is readily available to sample the head space gas from essentially all of the WIPP wastes. Analysis of the head space gas from, for example, ten percent of the waste packages (preferably at an elevated temperature) has the potential of producing a highly reliable database of the volatile organic compounds present. Some methods development would probably be needed, and the approach should be validated by more invasive analysis techniques.

The RFP plans to begin compacting all of its TRU wastes in 1990. It is likely that in the supercompacting process liquids will be pressed out of some of the packages being supercompacted. These liquids need to be removed for solidification or other treatment. Prior to treatment, these liquids could be sampled and analyzed for hazardous components.

Observation F.3:

Documents prepared by the RFP indicate that several types of hazardous materials used at the RFP and several hazardous wastes that are produced at the RFP do not end up in the TRU waste inventory. Further work by the BRP is needed to confirm that this is the case.

## G. MANAGEMENT OF THE TRU WASTE INVENTORY

Observation G.1:

A significant percentage of the waste packages currently in the TRU waste inventory at the RFP and at INEL (the only two generator/storage sites reviewed to date by the BRP) are believed to be low-level waste and not TRU waste. RFP and INEL estimate that eight to ten percent and around 50 percent, respectively, of their TRU waste inventory is expected to be low-level waste. This "misclassification" has resulted from a change in the TRU waste criterion from 10 nCi/g to 100 nCi/g of TRU radionuclides, and the use of less sophisticated assay equipment.

Recommendation G.1:

All waste packages in the TRU waste inventory at all DOE facilities that may contain less that 100 nCi/g of TRU radionuclides should be reassayed as soon as possible and removed from the TRU waste inventory, if the TRU radionuclide content is less than 100 nCi/g.

Discussion:

The retention of low-level waste in the TRU waste inventory has the potential to needlessly consume significant resources through "over management" of such waste. This misallocation of resources can occur in the consumption of valuable TRU waste storage space, certification of waste packages that need not go to WIPP, and the misuse of expensive disposal capacity at WIPP.

## H. WASTE ACCEPTANCE CRITERIA FOR WIPP

To date there has been insufficient time to fully assess the WAC for WIPP. While further time is needed to complete this assessment, some initial and preliminary thoughts are provided below.

Observation H.1:

It is not clear that the WAC are consistent with the source term databases being used for the performance assessment, the no migration petition, and the RCRA Part B permit application.

Recommendation H.1:

DOE needs to ensure that the databases being used for the performance assessment, the no migration petition, and the RCRA Part B permit application are consistent with the WAC. The databases should not assume that the WAC are controlling elements of the source term that the WAC in reality are not.

Observation H.2:

It is not clear how the performance assessment, the no migration petition, and the RCRA Part B permit application will take into consideration the authority of the WACCC to exempt wastes from the WAC in the future.

Recommendation H.2:

The WACCC should not grant any exemptions from the WAC until after WIPP has been demonstrated to comply with the EPA Standard. Exemptions to the WAC should be granted only if a technical assessment indicates that the performance of the repository will not be materially affected.

Observation H.3:

It is not clear that adequate methods are being used to ensure that the WAC for corrosives, pyrophorics, explosives, and RCRA constituents are being met. The BRP should pursue this matter further.

Observation H.4:

It is possible that waste containers that are vented and then allowed to aspirate in a high humidity environment (such as out-of-doors) may accumulate a significant amount of liquid.

Recommendation H.3:

Waste containers that are aspirated in non-humidity controlled environments should be subject to real-time radiography immediately prior to shipment to ensure that the criterion for liquids is not exceeded.

Observation H.5:

In addition to the WAC, wastes to be shipped to WIPP in TRUPACT-II must also comply with the conditions specified in the United States Nuclear Regulatory Commission's Certificate of Compliance, some of which are more restrictive than the WAC. In the future, the RCRA Part B permit for WIPP may impose additional restrictions on the wastes that can be received at WIPP.

Recommendation H.4:

DOE should develop comprehensive, integrated criteria and a unified certification process for determining what wastes can be shipped to WIPP. The WACCC should audit waste generators for compliance with this integrated set of criteria.

## I. AUDITING COMPLIANCE WITH THE WASTE ACCEPTANCE CRITERIA

Observation I.1:

The audit program conducted by the WACCC is a vital mechanism for ensuring that the TRU waste generators are properly certifying waste according to the WAC. While the existing audit approach has significant merit, additional steps would increase the effectiveness and credibility of the WAC and the auditing program.

Recommendation I.1:

DOE should actively encourage and facilitate observers from the New Mexico Environmental Improvement Division, the Colorado Department of Health, the State of Idaho, and the Environmental Evaluation Group to accompany the WACCC auditors.

Recommendation I.2:

The WACCC should conduct an unannounced audit at each TRU waste generator facility at least annually. In addition to reviewing the waste generators' certification records, the audit team should randomly select drums from the generators' inventory for radiological assaying and examination by real-time radiography under the audit team's observation. Audits of each generator should include enough waste packages to ensure at least a 95 percent confidence level that wastes are being properly certified.

## J. ROCKY FLATS WASTE RECERTIFICATION PROGRAM

A revised draft of the Rocky Flats Waste Recertification Program Plan (DOE/WIPP 89-025) was not received for review by the BRP until October 18, 1989. This revised plan was prepared in response to questions raised by the BRP. While this responsiveness is appreciated, the recent receipt of this document has not permitted thorough review nor has it allowed opportunity for discussion with DOE officials. Therefore, the following comments are very preliminary.

Observation J.1:

The recertification plan appears to be generally headed in the correct direction.

Discussion:

An important change from prior plans is the exclusion of low-level waste (waste having less than 100 nCi/g of TRU radionuclides) prior to recertification. Inclusion of state observers on the audit teams will improve public confidence in the recertification program. For the plan to have credibility, the level of observation/inspection needs to be very nearly full-time. The plan calls for the audit team to review each of the drums to be reassayed at the RFP. Given the on-going criminal investigation, limiting the audit team reviews to only the drums to be reassayed does not seem adequate. The plan does not include unannounced audits of RFP waste being recertified at INEL. The plan includes the opening of a number of waste containers and the physical inspection of contents, both at the RFP and at INEL. This presents an opportunity to collect data on the hazardous components in the wastes that will be useful in the performance assessment, the no migration petition, the RCRA Part B application, and other hazardous waste compliance issues regarding WIPP.

Recommendation J.1:

DOE should actively encourage and facilitate observers from the New Mexico Environmental Improvement Division, the Colorado Department of Health, and the Environmental Evaluation Group in the recertification audits/inspections.

**Recommendation J.2:**

In addition to the recertification procedure to be conducted by RFP personnel, the audit team should, on an unannounced basis, randomly select drums from each of major waste types in the RFP inventory for radiological assaying and real-time radiographic examination under the audit team's observation

**Recommendation J.3:**

Because the RFP and INEL will have the same contractor during the recertification program (and because of the on-going criminal investigation), unannounced audits of the recertification activities at INEL should be conducted to increase public credibility.

**Recommendation J.4:**

Since the recertification plan involves the opening of waste containers and the inspection of their contents, serious consideration should be given to obtaining data on the hazardous constituents of the wastes.

# WASTE ISOLATION PILOT PLANT (WIPP)

## BLUE RIBBON PANEL MEMBER REPORT

Newal Squyres
Boise, Idaho

October 23, 1989

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## EXECUTIVE SUMMARY

The Waste Isolation Pilot Plant (WIPP) Blue Ribbon Panel was established by the Secretary of Energy in late August of this year. The five members of the panel were each asked to provide an independent assessment of certain issues related to the recertification or validation of Rocky Flats Plant waste for shipment to WIPP and to the Draft Plan for the WIPP Test Phase: Performance Assessment and Operations Demonstration. Those issues and my recommendations are as follows:

**1. The proposed plan to validate Rocky Flats Plant certification of waste for shipment to WIPP.**

The latest draft of the Rocky Flats Waste Recertification Program Plan (DOE/WIPP 89-025) was received as this paper was being finalized. Although more detail needs to be provided, particularly concerning the audit of RFP's certification processes, it appears to contain most of the elements necessary to provide assurance that RFP generated waste has been properly certified. For waste at INEL, the plan should be developed in conjunction with the September 1989 draft RWMC/SWEPP Compliance Plan for TRUPACT-II Authorized Methods for Payload Control (TRAMPAC). Both plans should be circulated to EEG and/or other representatives of Colorado, New Mexico and Idaho for comment. No RFP waste should be shipped from INEL to WIPP unless it complies with the TRAMPAC plan, which requires a re-evaluation and examination of the certification for each drum to be shipped; and post-1985 INEL stored waste, which was WIPP/WAC certified by RFP, should not be shipped until validation of RFP's waste certification program. A Colorado representative should have the opportunity to observe each step of the planned re-examination of certain RFP waste to see whether it is properly classifiable as LLW, rather than TRU. RFP stored waste not examined under this procedure should not be shipped to WIPP unless it conforms to TRAMPAC, and its previous certification has been validated. Newly generated RFP waste should be certified to WIPP/WAC under any new procedures or compliance requirements flowing from the recertification/validation process.

**2. The concept and timing of the WIPP Demonstration Test Plan and the relationship between the performance assessment and operations demonstration.**

**a)** **Operations Demonstration**: The operational capability of WIPP to safely and efficiently receive and place waste underground is a critical component in fulfilling WIPP's research and development mission of demonstrating the safe disposal of defense generated radioactive waste. An operations demonstration will begin with the receipt of the first waste for use in the performance assessment process. Included in the scope of the operations demonstration must be the capability to retrieve all waste placed underground during the PA; retrieval plans must be correlated to the nature of the PA experiments and be sufficient for the scientific and technical community to believe they will work. The PA will be an evolving, iterative process. A full fledged operations demonstration should begin when sufficient data is received from the PA to establish with reasonable confidence the conditions (backfill and other engineering modifications) under which particular waste will be disposed of. Final decisions about the optimum design and use of the underground space, including such things as how the waste is stacked and whether some waste is segregated from other waste, will depend on information from the PA. Pending the satisfactory resolution of the institutional, technical and legal/regulatory considerations concerning WIPP's use as a permanent repository, serious consideration should be given to its use as an interim storage facility. In this capacity an operations demonstration would be conducted, which should provide useful information in the research and development process for WIPP.

b) Performance Assessment: The PA process involves TRU and mixed-TRU waste and different regulatory issues and approaches result from these distinctions in waste form. The regulatory requirements need to be clarified so the PA can provide the information necessary to satisfy the regulations or so that necessary changes and modifications can be made to the manner in which the waste is stored (including engineering modifications) or to the methods and procedures under which the waste is initially handled and packaged for shipment to WIPP. Lab scale experiments must begin as soon as possible. Bin-scale and room-scale (alcove) tests will begin as soon as operational readiness and regulatory authority are obtained. All of these tests are necessary to achieve regulatory compliance and to determine the conditions under which permanent disposal can begin. Based on the unique nature of WIPP and its research and development mission, the performance assessment phase should begin in full as soon as operational readiness is obtained. DOE should explore with ways to allow the experiments to begin even if final regulatory approval has not been obtained by the time operational readiness is achieved. DOE should continue to integrate and expand the PA database, based on WIPP/WAC and TRAMPAC compliance as well as the updating and expansion of the Preliminary Nonradionuclide Inventory for CH-TRU Waste (IT Corporation, May 1989). Information concerning the character of the waste, gathered to satisfy various compliance requirements, needs to be reported uniformly by generator site and coordinated with the process of determining whether, or in what manner, WIPP can comply with applicable regulatory standards. Better knowledge can be gained in the PA by making full use of all available information about the wastes to be shipped to WIPP. The PA process should take into consideration the fact that most of the waste destined for WIPP has not been generated and thus the results of the PA and the needs of the facility may affect the way waste is stored and handled at its inception. There should be a regular, formalized process of interaction and communication between the PA, WIPP/WAC personnel and the generator sites. The underlying assumptions about the character of the waste and the storage methodology used in the PA should be continually reexamined to insure that regulatory compliance and/or public confidence are not undermined by worst case scenarios or other assumptions which have no realistic basis in fact or which could be modified. The PA plan should not be constricted by unrealistic or arbitrary time limits that do not consider the research and development mission of WIPP or that do not reasonably correspond with the gathering of data necessary to determine the long term acceptability of WIPP as a permanent disposal site. Performance assessment, broadly defined, should continue as long as data is generated which supports modifications/improvements in the use of WIPP to demonstrate the safe disposal of TRU/Mixed-TRU waste. Based on the knowledge gained from using the facility, the waste management disposal systems at WIPP will probably not remain static. Changes may occur because of alterations or modifications in the character of waste shipped to WIPP, considering the time period when the waste was generated, the effect of RFP's waste minimization plan, the effect of compaction or other unanticipated changes which might flow from the increase in knowledge about WIPP. The PA is the principal mechanism to implement the congressionally mandated goal of demonstrating that a geological repository such as WIPP is a viable solution to the need for a safe long term disposal site. Continuing consultation and interaction with the EPA, NAS and EEG is appropriate and necessary to achieve this goal.

## DISCUSSION

## I. INTRODUCTION

The primary statutory basis for WIPP is contained in section 213(a) of Public Law 96-164, the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980. This section directed the Secretary of Energy to proceed with construction of the Waste Isolation Pilot Plant and further provided:

> Notwithstanding any other provision of law, the Waste Isolation Pilot Plant is authorized as a defense activity of the Department of Energy, administered by the Assistant Secretary of Energy for Defense Programs, for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission.

Congress required the Secretary of Energy to consult and cooperate with officials of the state of New Mexico in carrying out WIPP's mission and further provided in section 213(c):

> No law enacted after the date of the enactment of this act shall be held, considered, or construed as amending, superseding, or otherwise modifying any provision of this section unless such law does so by specifically and explicitly amending, repealing or superseding this section.

It is now nine years since Congress established WIPP's mission, and numerous groups, including this panel, are involved in addressing issues associated with beginning to use WIPP as a site for the disposal of TRU and mixed-TRU waste resulting from defense activities and programs of the United States.

At the initial briefing held for the panel, the representative from the National Academy of Sciences stressed the need to move forward with the test phase for WIPP in order to obtain the information necessary to determine the conditions under which WIPP can serve as a permanent disposal site. At the present time, TRU and mixed-TRU waste are stored "temporarily" at various sites throughout the United States with the vast majority being stored at the Idaho National Engineering Laboratory. A relatively small amount of more recently generated waste is stored at the Rocky Flats Plant (RFP) in Colorado, but there are currently strict limitations on the amount this may increase. Similar waste is being generated on a regular basis due to national security requirements. There is thus a strong national interest in storing and permanently disposing of this waste safely. WIPP was established by Congress (and has been funded in the total amount of $780 million through fiscal year 1989) to determine whether such a geologic repository can demonstrate its capability to serve as a permanent disposal site. That final decision cannot be made yet, but it is now time to do what is necessary for the research and development process to go forward.

## II. VALIDATION/RECERTIFICATION OF ROCKY FLATS PLANT WASTE FOR SHIPMENT TO WIPP

Because of recent events at the Rocky Flats Plant concerning, broadly speaking, its handling and disposal of waste from nuclear weapons production, DOE has perceived a need to validate or recertify waste previously certified by RFP to WIPP's Waste Acceptance Criteria standards. I am not aware of any allegations that directly relate to the WIPP/WAC certification program at RFP. No assertions have been made that any individuals associated with the certification process intentionally or negligently did something to raise any substantial concern about the original waste certification process. In addition, there have been periodic audits and inspections of the RFP WAC certification program conducted by WACCC, non-RFP personnel. My understanding is that an EEG representative has accompanied such audit teams and that no substantial problems have been identified. These are relevant considerations in evaluating the scope and efficacy of a plan to recertify Rocky Flats waste.

There are at least three interrelated, yet distinct, categories of waste involved in the validation/recertification program. First, there is a portion of previously certified RFP waste that may be properly classifiable as low level waste, rather than TRU. Re-examination of this limited category of waste will be conducted by re-assaying the waste with more sophisticated equipment than was used initially. The object is to determine whether a particular container has a sufficiently low amount of radioactive material to be characterized as low level radioactive waste, rather than TRU. Because this re-assay process may create an ability to continue storing this waste at RFP without contributing to the 1601 cubic yard limit agreed to by DOE and the state of Colorado, it is particularly important for an appropriate representative from Colorado to have the opportunity to be present during each step of the re-examination process. The Colorado representative should be fully briefed for a thorough understanding of how the waste was originally assayed; how the waste was identified for re-examination; and how the new equipment differs from the old, including the use of controls to assure that the new equipment is being operated and functions accurately to produce measurements that are not open to question. In summary, DOE should make the necessary arrangements with the Governor of Colorado to obtain the presence of a technically competent representative to sign off on this portion of the validation/recertification process.

The second category subject to the validation/recertification plan is waste now being stored at RFP, which was previously WIPP/WAC certified by RFP. Before this waste can be shipped to WIPP, it must also be certified for shipment under the TRUPACT-II authorized methods for payload control (TRAMPAC). The latest draft Rocky Flats Waste Recertification Program Plan (DOE/WIPP 89-025, October 1989) was received as this report was being prepared and has not been reviewed in detail. However, the plan for this category of waste contemplates an unannounced audit process administered by the WACCC. The audit will include quality assurance and record keeping activities but will focus on activities associated with initially packaging and certifying the waste. This appears to be an acceptable audit process but more information is needed concerning the actual scope and duration of the audit.

In addition, substantially more detail is needed concerning the plan to recertify that portion of the 1200 drums, less that determined to be low level in the re-assay process, to be shipped to WIPP. This portion of the plan should include a re-examination of each drum and its original certification by individuals not involved in the original certification. At least a significant number of randomly selected drums should be recertified by different people. Finally, the validation/recertification of this category of waste must be observed to the extent deemed appropriate by the states involved, and measures should continue to be taken to provide the opportunity for independent oversight in the development and implementation of the recertification program.

The third category of waste subject to this plan involves approximately 8800 drums of waste certified by RFP prior to shipment to INEL; this waste has been stored at INEL since 1985. The purpose of the draft RWMC/SWEPP Compliance Plan for TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) is to provide the methodology for examining each of these drums to make sure it can be shipped to WIPP in accordance with TRAMPAC criteria. Unfortunately, the TRAMPAC criteria were developed somewhat independently from the WIPP/WAC criteria, and it is possible that waste may be certifiable for acceptance at WIPP but not meet the criteria for TRUPACT-II shipment. As this plan is finalized, it could serve as a basis to integrate the WIPP/WAC with the TRAMPAC requirements so that one certification process satisfies both. In any event, DOE should make certain that compliance with WIPP/WAC will also provide compliance with TRAMPAC.

Because each container now stored at INEL and intended for shipment to WIPP must be re-examined to insure compliance with TRAMPAC, and because that process will begin in the very near future, the plan for the validation/recertification of RFP certified waste at INEL should be developed in conjunction with the TRAMPAC compliance plan. It appears that the draft TRAMPAC compliance plan contemplates an examination of the data generated when the waste was originally certified by the RFP, a 100% real time radiography (RTR) examination of each container and a random sampling process, all conducted at the SWEPP site. There should be an integration between the TRAMPAC compliance plan and the RFP recertification plan. An opportunity should be provided for comment on the proposed plans by the EEG and/or other appropriate state representatives, and arrangements should be made for independent observation of the implementation of the plans, if requested. Before going forward with a plan to validate or recertify RFP waste, DOE should be satisfied that appropriate groups and state representatives are in essential agreement with the plan's scope and methodology. This, plus a thorough briefing concerning the basis for DOE's confidence in RFP's certification processes, are necessary to blunt public skepticism concerning RFP's waste certification processes.

## III. CONCEPT AND TIMING OF THE WIPP DEMONSTRATION TEST PLAN; RELATIONSHIP BETWEEN THE PERFORMANCE ASSESSMENT AND OPERATIONS DEMONSTRATION

A. Operations Demonstration: An operations demonstration is necessary and will begin with the waste to be used in the test phase. The object of the performance assessment portion of the test plan is to develop the necessary information to determine the conditions under which the waste will be stored or disposed of to achieve regulatory compliance and the overall suitability of WIPP as a permanent repository for TRU/Mixed-TRU waste. Until the information from the PA becomes available to begin to make such decisions, an operations demonstration, conducted on the basis of assumptions about how the waste will be stored, seems premature. It has been continually stressed that the PA will involve an iterative, step by step learning process. The operational activities associated with receiving and placing the waste underground will be significantly influenced by what is learned in the PA concerning the behavior of the waste and the geologic repository. Because of uncertainties associated with the results of the PA and thus with any measures that may be necessary to counter unexpected or adverse conditions, flexibility needs to be maintained concerning the commencement of waste acceptance at capacity or near capacity rates. Essentially, I agree with NAS's observations and recommendation 6 of the Review Comments on DOE document DOE/WIPP 89-011: Draft Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment and

Operations Demonstration, July 19, 1989. At this juncture, the operations demonstration process should obviously make every effort to maximize what can be learned from emplacement of the waste needed for the PA. A plan should be developed to determine how best to maximize from an operational standpoint the experience gained with the waste to be used in the PA.

Perhaps an unspoken concern, at least in the limited experience of this member, is the belief that the current operations demonstration plan may provide a method for the temporary storage of waste, until the PA process is far enough along to make some final decisions concerning the use of WIPP to solve obvious problems existing in the management of TRU/Mixed-TRU waste. Stated simply, there is too much waste and no readily acceptable place to put it. Until sufficient information is available to demonstrate regulatory compliance of WIPP and to demonstrate its safety as a long term disposal site, issues concerning the temporary or interim storage of waste will be present.

In this regard, the NAS representative that met with the panel at its first meeting said, perhaps unofficially, that although the question had not been asked he did not oppose placing waste underground so long as it was recognized that the waste was not necessarily put there on a permanent basis. Common sense virtually compels the conclusion that waste is better stored underground at WIPP than it is above the surface, and this appeared to be the position of the NAS representative. Although the subject has been covered in part in the supplemental environmental impact statement, a detailed and thorough analysis needs to be done of the costs and benefits of continuing to store TRU and mixed-

TRU waste at interim sites not developed to assure the safe handling of such waste. There would appear to be certain beneficial effects from the use of WIPP as an interim storage facility in terms of an operations demonstration. These benefits alone would not justify such use but could be achieved through a well considered, conservative plan for using a portion of the facility for interim storage. The subject should be addressed with the regulatory agencies, including appropriate participation by those groups (EEG and NAS) long involved in evaluating WIPP and its proposed use.

B. Performance Assessment. The plans associated with the performance assessment to demonstrate regulatory compliance do not appear to take into consideration the difference in the regulatory scheme for radioactive waste (40 CFR 191, Subpart B) and hazardous waste (40 CFR 268). These differences are illustrated, for example, by different definitions of "disposal". With respect to radioactive TRU waste, "disposal of waste in a mined geologic repository occurs when all of the shafts to the repository are backfilled and sealed." 40 CFR 191.02(l). On the other hand, for hazardous waste, "land disposal" means placement in the land and includes placement in a salt bed formation, underground mine or cave. 40 CFR 268.2(a). An estimated 50% to 60% of the defense generated waste to be emplaced at WIPP is mixed, containing both hazardous constituents and TRU radioactive waste. The regulatory process needs to address these facts about the waste WIPP must contend with to fulfill its mission.

The Environmental Protection Agency is currently considering DOE's no migration petition, filed pursuant to 40 CFR 268.6. Until the no migration petition is approved, mixed waste apparently will not be put underground at WIPP. If the no migration petition is not approved or is delayed, current plans for the PA will have to be modified. The term of a no migration petition may be only 10 years, and this could pose downstream problems for waste emplaced at WIPP in reliance on the no migration petition exemption. Even if the no migration petition is granted, what appears to be an inconsistent regulatory approach, or perhaps better termed a non-approach, to the regulation of TRU/Mixed-TRU waste creates potentially fertile ground for future problems. An effort should be made to reconcile or harmonize what appear to be conflicting regulatory approaches. DOE should probably not assume that the no migration petition will be granted in a timely fashion and should therefore begin to develop contingency plans for the PA, specifically including an early approach to EPA to develop a way to begin the presently planned experiments at WIPP as soon as operational readiness is achieved.

A combination of lab scale, bin-scale and alcove tests are clearly necessary to develop the information for a satisfactory performance assessment, and just as importantly, to gather data necessary to predict the net behavior of the rooms for long term disposal purposes. The performance assessment/experimental program must adequately address the concerns, and seek solutions, raised by the presence of hazardous constituents, particularly volatile organics, in the waste intended for disposal at WIPP. An increased effort should be made to insure that as much pertinent and uniform data as possible is gathered for these purposes from all available sources, including the WIPP/WAC and TRAMPAC compliance process and an ongoing update of the Preliminary Nonradionuclide Inventory for CH-TRU waste.

DOE and its contractors appear to be making progress in responding to NAS recommendations concerning the performance assessment/experimental test program. Scientific and public confidence in this program is obviously enhanced by input received from NAS, EEG and EPA together with the recognition that the process is an iterative one, which requires constant flexibility and openness in recognizing potential problems and developing solutions, so that regulatory compliance can be achieved and decisions made about permanent disposal. A formal mechanism should be established so that the personnel involved with performance assessment/experimental test program work closely with the personnel, from WIPP and the generator sites, responsible for WIPP/WAC and TRAMPAC compliance. This will provide for early identification and implementation of measures intended to remedy known or anticipated problems.

There should be a direct relationship between the results, even preliminary, from the performance assessment and the conduct of an operations demonstration. Planning for the performance assessment and the first receipt of waste, including the timing and volume of waste received, should be conducted so as to maximize the opportunity to test, verify and modify, if appropriate, the operational plan for waste receipt and emplacement.

Short term goals, such as compliance with 40 CFR 191 and reaching an early decision concerning permanent disposal, cannot predominate over the long term goal of establishing the conditions for WIPP's use as a final repository for TRU and mixed-TRU waste. The solutions to the gas generation and brine inflow issues, for example, may evolve and may permit a portion of the facility to be used as a final repository but nevertheless warrant modifications or changes in both the waste form and repository usage for another portion of the site. Regulatory issues may be resolved differently at one point in time than another, because of the continuing learning process. In terms of complying with 40 CFR 191, PA personnel should continue to consider NAS's suggestion to supplement the numerical predictions of a performance assessment with qualitative judgments. It may be necessary to continue aspects of the performance assessment/experimental program even after a final decision is made that certain portions of the repository can be used for permanent disposal.

## IV. ADDITIONAL CONSIDERATIONS AND CONCLUSION

Progress appears to have been made by the DOE in recognizing the need for better coordination and integration among various people and groups with responsibility for WIPP. In order to make the transition from the site selection/construction phase of WIPP to its actual use to fulfill the congressionally mandated goal of providing a research and development facility to demonstrate the safe disposal of defense weapons production generated waste, DOE and its contractors are now required to focus realistically on the so-called institutional concerns and decide what needs to be done to put WIPP in use. Resolution of these institutional concerns should be enhanced by the progress made in meeting the concerns expressed by the NAS and EEG concerning the performance assessment/experimental program phase.

From an operational and technical standpoint, WIPP is about ready to begin receiving waste as the project moves from the construction phase to the test phase. Significant institutional and regulatory issues remain to be resolved but these issues do not go to the merits of WIPP's functional ability to serve as a valuable national resource of providing a place to store defense generated nuclear waste. Once operational readiness is achieved, there is no reason not to go forward with the test phase, which should be conducted to the maximum extent possible on site at WIPP. So long as the ability to retrieve the emplaced waste is maintained. WIPP should be put to use. If funds need to be set aside in order for public confidence to exist with respect to retrievability, then that should be done. WIPP is a unique facility, whose very existence and current status are the result of the hard work and dedication of numerous groups both inside and outside the government. There are an infinite number of variables associated with the way WIPP may ultimately be used as a disposal site, and there will no doubt be troublesome issues that must be resolved in the course of making the decisions about that use. But those decisions are not being made in a vacuum or without the opportunity for oversight by groups representing the public interest, particularly the states directly involved. It is reassuring that not once during my involvement in this project did anyone suggest that a particular course of action should be taken for national security reasons. Clearly, there are national security issues at stake when one considers the disposal of defense-generated waste. But the history of WIPP's development clearly illustrates that decisions about its use will not be made in secret or without significant involvement of groups outside of DOE and its contractors. To this point, decisions about WIPP appear to have been made based on the best available technical and scientific input from numerous sources. This should continue as decisions are made about its future use as a repository for actual waste, for only in this manner will the proper decisions be made, in the national interest, about WIPP's ultimate suitability as a permanent repository.

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